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AN EXAMINATION OF THE
DEDUCTIVE LOGIC OF
JOHN STUART MILL,

BY
REGINALD JACKSON
LECTURER IN ANCIENT PHILOSOPHY
IN THE UNIVERSITY OF EDINBURGH

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PREFACE

THE preparation of this book for publication as a monograph entailed the reduction, to half its original bulk, of a thesis accepted by the University of St. Andrews for the degree of D.Litt. The reduction was achieved, not by compression, but by the excision of several chapters concerning problems which Mill disastrously neglects. The result is a work, poorer in content, but more loyal to its title. I hope on another occasion to publish some of the material now omitted. I hope also to complete and publish an examination of Mill's *inductive* logic.

'Mr. Mill's *Logic* has never been subjected to a careful review on the part either of his supporters or opponents.'¹ True in 1866; still true in 1940. Excusable in 1866; no longer excusable in 1940. In 1889 Venn said, in the Preface to his *Empirical Logic*. 'As many readers will probably perceive, the main original guiding influence with me,—as with most of those of the middle generation, and especially with most of those who approached Logic with a previous mathematical or scientific training,—was that of Mill' In 1921 Johnson said, in the Preface to his *Logic*: 'As regards Material Logic, I have taken Mill's *System of Logic* as the first basis of discussion, which however is subjected to important criticisms mostly on the lines of the so-called conceptualist logicians.' Logicians less in sympathy with Mill are hardly less indebted to him. When we turn to Welton's *Manual of Logic* or to Mr. Joseph's *Introduction to Logic*, we find in the Index the acknowledgement which the Preface withholds.

Those who concede that Mill's place in Inductive Logic (at least in the Logic of Demonstrative Induction) is comparable to Aristotle's place in Deductive Logic (at least in the Logic of Syllogistic Deduction) may still protest that it is not Mill's Deductive Logic but his Inductive Logic that merits examination. 'Mr. Mill, however, has given an impulse to the study,

¹ McCosh, *An Examination of Mr J S Mill's Philosophy*, p. 266

not by the portion of his work which treats of Formal Logic—which is not of much scientific value, but by his admirable exposition of the Logic of Induction.¹ I hope on another occasion to show that it is largely because Mill's *Deductive* Logic 'has never been subjected to a careful review' that none of the many reviews of Mill's *Inductive* Logic has been sufficiently careful. What I want now to urge is that Mill's *Deductive* Logic, even if it stood alone, would still merit examination.

McCosh's opinion that Mill's treatment of Formal Logic 'is not of much scientific value' is sufficiently explained by the fact that he² grasped Mill's quarrel with 'the defenders of the syllogistic theory' as imperfectly as Courtney³ grasped Mill's quarrel with its 'assailants'. But I could wish that Professor Stebbing had not said.⁴ 'The "Inductive Logicians", of whom J. S. Mill is the foremost example, have made no attempt to remedy the deficiencies of the traditional Formal Logic.' The context shows that the 'deficiencies' which Professor Stebbing has especially in view were 'the acceptance of the subject-predicate doctrine, of the traditional schedule of propositions, and the restriction of deduction to the syllogistic form'. I admit that Mill left *these* doctrines as he found them. He was as far as were his orthodox opponents from a recognition of non-syllogistic deduction. But, while Mill discovered no new *species* of deduction, he did advance a new view about the *genus*.

'It is the characteristic mark of logical propositions that one can perceive in the symbol alone that they are true.'⁵ That this is the characteristic mark of propositions of the form '*p* implies *q*' is a doctrine which Mill did not so much discover as adopt.⁶ He certainly did not anticipate Professor Wittgenstein's

¹ McCosh, *Philosophical Papers*, p. 414.

² *An Examination of Mr. J. S. Mill's Philosophy*, pp. 306, 314-16.

³ *Life of John Stuart Mill*, pp. 79, 82-5. Cf. *The Metaphysics of John Stuart Mill*, pp. 100, 146. On p. 148 Courtney confesses "The special doctrines of Mill's "System of Logic" I have not the power or the wish to criticise."

⁴ *A Modern Introduction to Logic*, Preface, p. viii.

⁵ Wittgenstein, *Tractatus Logico-Philosophicus*, 6.113.

⁶ Mill's debt to Campbell and Stewart would have been widely known through Whately. Mill himself refers in this connexion only to Brown.

further claim that 'this fact contains in itself the whole philosophy of logic'. His originality lies in his attempt to show how deduction, although it is *merely verbal* transformation, can be serviceable. In the Preface to his edition of Jevons,¹ Adamson says of Mill: 'A pure logic, or logic of consistency in the employment of language, he did, indeed, admit to be possible, but in no way accorded to it special importance.' Yet, in one of the two passages to which Adamson refers us, we find Mill saying that it is 'of the greatest importance'.² And in Book II, Chapter iii, of his *System of Logic*, Mill makes a determined attempt to justify this estimate. His Inductive Logic is founded on the conviction that the attempt is successful.

If this is the nature of Mill's Deductive Logic, why do I not, instead of myself attempting to examine it, pray for the advent of a Logical Positivist to whom it is not indifferent whether what he has thought has already been thought before him by another?³ Because I am convinced that those who disagree most can profit most, if only they are willing to learn from an opponent. In the Preface to the first edition of his *Logic*, Bosanquet expresses his 'strong conviction that the reform of Logic in this country dates from the work of Stuart Mill, whose genius placed him, in spite of all philosophical short-comings, on the right side as against the degenerate representatives of Aristotle'. I think that Mill was on the wrong side. Had he been on the right side, his genius might

¹ *Pure Logic and other Minor Works*, p. 115

² *Examination of Hamilton* (third edition), p. 461. In his *Autobiography* Mill tells how 'from about the age of twelve' (p. 17) his father 'attempted by questions' to make him 'frame some conception of what constituted the utility of the syllogistic logic', how, after seeing, twelve years later, 'that in the more perfect of the sciences, we ascend, by generalization from particulars, to the tendencies of causes considered singly, and then reason downward from those separate tendencies, to the effect of the same causes when combined', Mill asked himself 'what is the ultimate analysis of this deductive process, the common theory of the syllogism evidently throwing no light upon it' (p. 159), how, at last, from Stewart's idea 'respecting the use of axioms in ratiocination', there 'grew the theory of the Syllogism propounded in the Second Book of the Logic' which enabled Mill to proceed 'with greatly increased hope of being able to produce a work on Logic, of some originality and value' (p. 181)

³ Cf. *Tractatus Logico-Philosophicus*, p. 27

have been equal to the task of showing that it *was* the right side. But, before his genius matured, the philosophical shortcomings of his father had already placed him on the wrong side. His genius can show *us* what it could not show *him* and what his opponents, although on the right side, could show nobody.

There has been too much complaint about Mill's inconsistencies. They are due partly to his capacity for sympathizing with conflicting doctrines, partly to his lack of leisure for revision. Nor should we forget that Mill's marvellous intelligibility enables us to detect inconsistency which in other philosophers would be mistaken for profundity. To the savage¹ attack made on Mill by Jevons in the *Contemporary Review* (1877) I have replied in an article to be published in *Mind*.

Nearly seventeen years have passed since Professor Prichard told me that knowledge could be intuitive. I scorned the suggestion. Having just travelled seven thousand miles for the purpose of discovering how knowledge was possible, I feared that, if knowledge could be intuitive, there would be no merit in being a philosopher. It was Professor Price who, by tactfully giving me enough rope to hang myself, enabled me to rise on a stepping-stone of my dead self to more Prichardian things. I came at last to see that the recognition that knowledge can be intuitive makes philosophy, not easy where it would otherwise be difficult, but possible where it would otherwise be impossible. Kant, indeed, who like Mill failed to recognize that knowledge can be intuitive, tried in vain, as Professor Prichard has shown, to avoid the admission that knowledge is impossible. Kant's knowledge about mere appearances turns out to be merely apparent knowledge. Mill's merely verbal propositions turn out to be, if not sheer tautologies, real propositions about words and so merely apparently *a priori*.

In the formation of my conclusions about Mill's deductive

¹ The scurrilous attempt to prove Mill either a knave or a fool, made by an anonymous writer who succeeds only in proving himself both, under the title *Hamilton versus Mill*, is best forgotten.

logic, I have had to rely, more than I could have wished, on my own resources. It is in the *acquisition*, much more than in the *application*, of these resources that my obligations have been incurred. Ever since the tutor's benevolence and the pupil's self-love first conspired to usurp the functions of conscience, Professor Price has been a source of inexhaustible counsel and encouragement. Of my many obligations to others the greatest are to Professor G. E. Moore and to Mr. Gilbert Ryle.

Chapter XIII owes its origin to Professor T. M. Knox, who urged me to survey and connect the three 'accounts' of syllogism. Professor Price, at the request of the Clarendon Press, has, by numerous helpful suggestions, enabled me further to ease the reader's burden. I fear that the burden may still be severe; and I am grateful to the Clarendon Press for undertaking, amid the strenuous preoccupations of 1940, the publication of a book which would not, however generous the margin of leisure, be read by many.

R. J.

EDINBURGH

June 1940

CONTENTS

I. EPISTEMOLOGICAL STANDPOINT	1
II. SCOPE OF LOGIC	15
✓III. CONNOTATIVE AND NON-CONNOTATIVE NAMES	26
IV. PROPOSITIONS—THE GHOST OF NOMINALISM	30
V. MERELY VERBAL PROPOSITIONS	41
VI. MERELY APPARENT INFERENCE	57
VII. PRINCIPLE OF SYLLOGISM	65
VIII. REPLY TO THE CHARGE OF <i>PETITIO PRINCIPII</i>	77
IX. FIRST ACCOUNT OF SYLLOGISM	85
X. SECOND ACCOUNT OF SYLLOGISM	105
XI. INFLUENCE OF EPISTEMOLOGICAL STANDPOINT	120
XII. THIRD ACCOUNT OF SYLLOGISM	138
XIII. SURVEY	164
XIV. DEDUCTIVE SCIENCE	175
INDEX OF PROPER NAMES	195

References are, where neither edition nor volume is specified, to Volume I of the eighth edition of Mill's *System of Logic* and to the third edition of *An Examination of Sir William Hamilton's Philosophy*.

CHAPTER I

EPISTEMOLOGICAL STANDPOINT

MILL'S *System of Logic* is an elaborate attempt to defend epistemological empiricism at its most vulnerable point.

It is hoped by the qualification 'epistemological' to dispel obscurity. Empiricism has been said to be the doctrine that all knowledge has its source in, originates out of, is gained through, is derived from, or is founded on experience. But Locke, who claims¹ that in experience 'all our knowledge is founded, and from that it ultimately derives itself', yet unequivocally admits² self-evident propositions ('instructive' as distinguished from 'trifling'). And Kant, who begins his Introduction to the second edition of the *Critique of Pure Reason* with the emphatic admission: 'That all our knowledge begins with experience there can be no doubt', at once goes on to warn us: 'But although all our knowledge begins with experience, it does not follow that all our knowledge arises out of (*entspringt aus*) experience.' And it is not easy to ascertain whether what Kant denies is what Locke affirms. Now the harmful ambiguity of such formulae and of the dictionary definitions of 'empiricism' lies not so much in the word 'knowledge' nor even in the word 'experience' as in the various equally unhelpful devices for symbolizing the relation asserted between knowledge and experience. It is in order to determine this relation that the qualification 'epistemological' has been pressed into service. When once this relation has been determined neither the word 'knowledge' nor the word 'experience' will be found troublesome.

Epistemology must be distinguished not only from genetic, but also from analytic, psychology. An epistemological doctrine concerns neither the causes of any cognition, whether belief or, in view of what is grasped, knowledge, nor even the nature of knowledge in those respects in which knowledge resembles belief. An epistemological doctrine concerns the

¹ *Essay*, II 1, § 2

IV. VII, VIII

nature of knowledge solely in that respect in which knowledge differs from belief, and thus it concerns the nature of evidence. 'Epistemological empiricism' may be defined either as the doctrine that an appeal to experience is the only kind of knowledge or, equivalently, as the doctrine that experience is the only kind of evidence. To reject the doctrine is not to claim that it is possible to know without experience. If indeed 'experience' is given its widest applicability, knowledge is a determinate of experience. But, however the applicability of 'experience' is restricted, to reject epistemological empiricism is not to deny that experience is an indispensable antecedent or concomitant, or even an indispensable constituent, of knowledge. For the epistemological question is not: What else must be for knowledge to be? nor even: What must a cognition be to be knowledge? but only: What must a cognition be to be *knowledge rather than belief*?

Consider what at least seems to be a self-evident fact. That every three-sided plane rectilinear figure is three-angled seems not to be evidenced by experience. It may be that without having traced or seen, that without even now either tracing or seeing or imaging, approximately triangular figures we should be unable to entertain the question and consequently unable to know the answer. But this possibly indispensable experience seems in two ways to betray its inadequacy as evidence: (1) We have such experience of only some such figures; yet we are, as long as we keep the question clearly before us, fully confident about all, and not only all actual but even all possible, confident even that a figure which is not three-sided *would* be three-angled if it *were* three-sided. Even if we were less than fully confident about unexperienced figures, what experience would justify the claim that they even probably followed the rule? (2) The figures which we trace or see are imperfect. The lines are not straight; the angles are more than three. Even if they were perfect, we could by no examination of them establish their perfection. So experience does not warrant the claim even that this or that figure is three-angled.

The reply of epistemological empiricism to such arguments

will occupy us later. We are trying now not to refute but only to understand epistemological empiricism, and at the moment to understand what is, and what is not, denied to experience by those who reject epistemological empiricism. We shall do well to notice that in whatever respect experience is indispensable to the *knowledge*, it is indispensable also to the *true belief*, that every three-sided plane rectilinear figure is three-angled, and even to the *false belief* that some three-sided plane rectilinear figures are not three-angled.

The doctrine, that it is possible to know, while not without *experience*, yet without *appeal to experience*, has been compactly embodied in the expression 'intuitive induction'. The expression is an instructive hybrid. The adjective is epistemological, the noun psychological (genetic). The same cognition is called 'intuitive' because of what it is, in that respect in which it is knowledge rather than belief, and is called 'induction' because of the way in which it comes to be, a way in which belief may also come to be. This application of the word 'induction', however justified as a paradox whereby to call attention to the compatibility of the epistemological claim with the psychological concession, cannot conveniently be incorporated in the abiding terminology of logic. But there is no word other than 'intuition' whereby to distinguish the knowledge which appeals to self-evidence. And though the same word has been frequently applied also to perception and to introspection, the common element being the negative character, non-inferential, it is to the knowledge which appeals to self-evidence that the word can be most conveniently restricted. So restricting it, we may, again equivalently, define epistemological empiricism as the doctrine that no knowledge is intuitive, the doctrine that no facts are self-evident.

Why should epistemological empiricism find peculiar difficulty in occupying the province of logic? Why should the rejection of the notion of self-evidence be peculiarly awkward for the logician?

It is often said that only what can be proved can be known. And it is often replied that proof at best shows only that our

title to what we prove is as good as our title to something else which we do not prove. All proof must start from unproved premisses. Nothing proved can be more worthy of acceptance than some things which are not proved. But the reply does not eradicate the error. Those who say that only what can be proved can be known must be understood to rate as proof not only what logicians so call but also perception and introspection, or rather the putting somebody in the way of knowing by perception or introspection, in general by appeal to experience, a disputed fact. This wide sense of the word 'proof' is conformable to its etymology. It is also a sense in which we all occasionally use the word. If in support of the statement that Mr. Eden is in London I take you to a place from which you can observe him, you allow that I prove my statement and in a most satisfying manner. The word 'proof' has also been used to cover the putting somebody in the way of grasping even self-evidence. But this use has neither etymology nor currency nor convenience in its favour. At any rate people who say that only what can be proved can be known are not using the word in this way. The proposition is indeed nothing but a rough-and-ready formulation of epistemological empiricism.

To the obvious objection, then, that all proof must start from unproved premisses the epistemological empiricist can reply that unproved premisses need not, in order to be known, be self-evident. Moreover the difficulty, if it is one, is not a difficulty for the logician. His province is not *inferential knowledge* but only *valid inference*. How, even whether, ultimate premisses are known, is beyond the scope of logic.

Though the epistemological empiricist may in his logical capacity fairly decline the task of answering this obvious objection and though the task is anyway not onerous, the objection when answered nevertheless imposes a special burden on the epistemological empiricist, and in his logical capacity—in his logical capacity, since surely it does devolve upon the logician to give such an account of valid inference as will leave it at least possible that valid inference *may* be what, albeit

outside the province of logic, we know that valid inference *must* be. Now the special burden which the answer to the obvious objection imposes on the epistemological empiricist is this: He needs to make the most of valid inference.

His need is determined by the poverty of his ultimate premisses. Ultimate premisses can be known only by perception, introspection, memory, or intuition. These may be more than all the ways of knowing ultimate premisses; but we are sure at least that there are no others. The epistemological empiricist rejects intuition. Memory may be disregarded since, even if it is possible for a fact to be known by memory without being first known in some other way, no such fact can relevantly differ from other ultimate premisses. Now the only facts knowable by either perception or introspection are singular categoricals. These then are the sole ultimate premisses of the epistemological empiricist. Whatever else can be known must be represented as validly inferable from these.

If, while the epistemological empiricist thus needs to make much of valid inference, he should turn out to be able to make nothing whatever of valid inference, he will appear in the unhappy predicament of one at war with a sole source of indispensable supplies. This is just what we find. His ban on intuition cuts him off from the very commodity for which it at the same time strengthens the demand. For the ban on intuition destroys the basis, not of inferential knowledge in particular (the point singled out for attack by the obvious objection), but of valid inference in general. Epistemological empiricism accordingly undermines, and this is why it is peculiarly vulnerable in the province of logic, the very operation whose nature it is the business of logic to examine.

This less obvious objection becomes obvious the moment we recognize that ultimate *premisses* are not the only indispensable ultimate *data*. Recognizing this, we can hardly fail to recognize that q cannot be validly inferred from p unless \bar{p} or q is self-evident.¹

It is from his attempt to meet this objection that the unity

¹ ' \bar{p} ' is the contradictory of ' p '.

of Mill's *System of Logic* is derived. His answer to the objection is dominated by his distinction between *real* and *merely apparent inference*, a specification of his distinction between *real* and *merely verbal propositions*.

The operations which the orthodox logician takes for valid inferences Mill declares to be mistaken for inferences. He allows that they are valid operations. He is even concerned to stress their importance. But he holds that their nature is misunderstood when they are taken for inferences. Here \bar{p} or q looks self-evident, but only because in asserting q you assert nothing which you do not assert in asserting p . Accordingly, \bar{p} or q is a merely verbal proposition, and the transition from the assertion of p to the assertion of q is not inference but merely verbal transformation. The interest of this part of Mill's programme, assigned to Book II, 'Of Reasoning', lies not so much in his attempt to show that the operations in question are merely verbal transformations as in his attempt to show how, if this be their true character, they can nevertheless be important.

Real inferences, he declares, are mistaken by the orthodox logician for invalid inferences. Here in asserting q you do assert something which you do not assert in asserting p . Accordingly, \bar{p} or q is a real proposition; and just because it is, it neither is nor looks self-evident. How q can yet be validly inferred from p , Mill ought to tell us in Book II, 'Of Reasoning'. For he ought there to tell us not only what reasoning is *not* but also, though without distinguishing its modes, what it *is*. Unfortunately, he elects to reserve his answer for Book III, 'Of Induction'. Induction 'is, without doubt, a process of real inference. The conclusion in an induction embraces more than is contained in the premises. . . . The nature and grounds of this inference, and the conditions necessary to make it legitimate, will be the subject of discussion in the Third Book.'¹ But, partly because Book III is preoccupied with the *various* conditions necessary to make inference legitimate (and, in discussing these, Mill considers himself entitled

¹ p. 187.

no less than the orthodox logician to make deductive formulation the test of validity), partly because the question is unanswerable, the question how, where \bar{p} or q is not self-evident, q can yet be validly inferred from p , is never fairly faced.

The answer to it is nevertheless an indispensable part of Mill's programme. For, since, whatever may be the importance of apparent inference, in asserting the so-called 'conclusion' of an apparent inference, you assert nothing which you do not assert in asserting its so-called 'premiss', it is by real inference alone that perceptual and introspective knowledge, knowledge of only singular categoricals, can be supplemented. Now it is clear in advance that the attempt to represent real inference as valid must either abandon epistemological empiricism or fail. For how, if not self-evident, is \bar{p} or q to be known? Since not self-evident, not by intuition. And \bar{p} or q is surely not knowable by either perception or introspection. It might be apparently inferred from \bar{p} or from q . But as Mr. Bertrand Russell has said:¹

'Whenever p is false, " $\text{not}-p$ or q " is true, but is useless for inference, which requires that p should be true. Whenever q is already known to be true, " $\text{not}-p$ or q " is of course also known to be true, but is again useless for inference, since q is already known, and therefore does not need to be inferred. In fact, inference only arises when " $\text{not}-p$ or q " can be known without our knowing already which of the two alternatives it is that makes the disjunction true.'²

There remains only real inference. But if in order to infer q from p it is necessary to infer \bar{p} or q from r , how is \bar{r} or \bar{p} or q to be known? There is no escaping the objection that a proposition can be validly inferred only if it is a member of a self-evident composite proposition.

To all this the epistemological empiricist may retort that, if the word 'knowledge' is to be rigorously applied, there is, whatever our epistemological position, no avoiding the admission that we know little or nothing, and that it is therefore

¹ *Intro Math Phil*, p 153. Cf *Mind*, N S CXXIX 156, p 451.

² I cannot admit Mr. Russell's further contention, 'It is the truth of " $\text{not}-p$ or q " that is required for the *validity* of the inference, what is required further is only required for the practical feasibility of the inference.'

no *reductio ad absurdum* of an epistemological doctrine to show that it involves this conclusion. As our other cognitions fall short of knowledge so do our cognitions of facts of the form \bar{p} or q . There is, accordingly, a loss of certainty in the transition from the premiss to the conclusion of every real inference. But, while demonstrative inference is thus beyond human capacity, there remains problematic inference. And this retort would do justice to Mill's position. But the retort will not save epistemological empiricism. However we relax the rigour of the applicability of the word 'knowledge', bestowing it upon grades of cognition inferior to knowledge proper, epistemological empiricism is still exposed to what is, in principle, the same objection. With whatever shadow of confidence you infer q from p you are bound to accept \bar{p} or q . Now, to say how this proposition can be *rationally opined* is, unless we abandon epistemological empiricism, no less difficult than to say how it can be *known*. The decisive objection against epistemological empiricism is not that it requires that our best inferences fall short of knowledge. The admission that they do becomes a finite intelligence. The decisive objection is that epistemological empiricism puts the scientist no nearer knowledge than the ignoramus.

Since the ban on intuition destroys the basis of valid inference in general, it may seem purposeless to insist, as has been insisted, that the epistemological empiricist needs, in view of the poverty of his ultimate premisses, to make the most of valid inference. For, however well equipped with ultimate premisses, the epistemological empiricist is of course bound, in his logical capacity, to make *something* of valid inference. But our purpose is not a mere refutation of epistemological empiricism, but an understanding of Mill's position. And it is important to recognize that Mill's claim 'that induction by simple enumeration may in some remarkable cases amount practically to proof'¹ is determined by anxiety to stop two gaps. Having declared the operations which the orthodox logician takes for valid inferences to be only apparent inferences, Mill

¹ p. 361.

is anxious to find a candidate for the title 'real inference'. Having rejected the view that 'axioms' are self-evident, Mill is anxious also to find a method of validly inferring them 'from the evidence of our senses'.¹

Mill strangely underestimates the controversial character of his work:

'Logic is common ground on which the partisans of Hartley and of Reid, of Locke and of Kant, may meet and join hands. Particular and detached opinions of all these thinkers will no doubt occasionally be controverted, since all of them were logicians as well as metaphysicians; but the field on which their principal battles have been fought, lies beyond the boundaries of our science'.²

'And I can conscientiously affirm that no one proposition laid down in this work has been adopted for the sake of establishing, or with any reference to its fitness for being employed in establishing, preconceived opinions in any department of knowledge or of inquiry on which the speculative world is still undecided'.³

Indeed, epistemological empiricism, which I take to be the key to his *System of Logic*, Mill's Introduction completely fails to introduce.

One passage even requires some pains to be so interpreted as not to compel the conclusion that Mill, not content with omitting to declare himself for, goes so far as to declare himself against, epistemological empiricism.⁴

'Truths are known to us in two ways: some are known directly, and of themselves, some through the medium of other truths. The former are the subject of Intuition, or Consciousness, the latter, of Inference. The truths known by intuition are the original premises from which all others are inferred. Our assent to the conclusion being grounded on the truth of the premises, we never could arrive at any knowledge by reasoning, unless something could be known antecedently to all reasoning'.⁵

It has already been seen that the epistemological empiricist can consistently admit that ultimate premisses are indispensable to inferential knowledge. Such premisses must be

¹ p. 266.

² p. 13.

³ p. 14.

⁴ It is thus that McCosh interprets this and similar passages. See *An Examination of Mr J. S. Mill's Philosophy*, chapter III, especially pp. 51-3.

⁵ p. 5.

knowable otherwise than by inference. It does not follow that they must be self-evident. It is open to the epistemological empiricist to contend that all ultimate premisses are knowable, as some unquestionably are, by either perception or introspection, though this contention costs the admission that the only knowable ultimate premisses are singular categoricals. It has also already been remarked that the word 'intuition', while most conveniently restricted to the knowledge which appeals to self-evidence, has been frequently applied also to perception and to introspection. That Mill describes the indispensable ultimate premisses as 'the subject of Intuition, or Consciousness' and 'truths known by intuition', need not then surprise us. That he also describes them as 'known directly, and of themselves' and as 'facts known *per se*'¹ and even, by implication, as 'self-evident',² is more disquieting. But if Mill held the truths in question to be self-evident his statement 'The truths known by intuition are the original premises from which all others are inferred'³ would commit him to extreme epistemological rationalism. He would be claiming that *all* knowledge is *a priori*. Moreover, the examples which he offers suffice to show that he does not hold the truths in question to be self-evident. His 'facts known *per se*' are 'any one's present sensations, or other states of subjective consciousness'.⁴ And 'Examples of truths known to us by immediate consciousness, are our own bodily sensations and mental feelings. I know directly, and of my own knowledge, that I was vexed yesterday, or that I am hungry to-day.'⁵

But, while Mill's examples suffice to show that he does not hold the truths in question to be self-evident, they hardly suffice to show what view he *does* take of the nature of their evidence. It would perhaps be hypercritical to make the obvious point that a description of any *truths* whether as 'bodily sensations' or as 'mental feelings' sacrifices accuracy to brevity. But, while Mill gives examples of the truths loosely, even if excusably, called 'mental feelings', he gives none of the truths loosely, even if again excusably, called

¹ p 312² p 18³ p 5⁴ p 312⁵ p 5

'bodily sensations'. Is our knowledge of the latter thought by Mill to be exactly the same in kind as our knowledge of the former? Of the words 'Intuition' and 'Consciousness' he says: 'I use these terms indiscriminately, because, for the purpose in view, there is no need for making any distinction between them. But metaphysicians usually restrict the name Intuition to the direct knowledge we are supposed to have of things external to our minds, and Consciousness to our knowledge of our own mental phenomena'¹

Since, however, 'the purpose in view' is only to insist on the indispensability of premisses known otherwise than by inference, there is so far no point at issue between Mill and the 'metaphysicians'. But Mill later expresses the opinion that we have no knowledge whether direct or indirect 'of things external to our minds'. For he defines 'Body' as 'the external cause, and (according to the more reasonable opinion) the unknown external cause, to which we refer our sensations'.² It would still be open to him to draw a distinction between the way in which ultimate premisses concerning 'bodily sensations' and the way in which ultimate premisses concerning 'mental feelings' are known. But of 'the division commonly made of feelings into Bodily and Mental'³ he says:

'Philosophically speaking, there is no foundation at all for this distinction even sensations are states of the sentient mind, not states of the body, as distinguished from it. What I am conscious of when I see the colour blue, is a feeling of blue colour, which is one thing, the picture on my retina, or the phenomenon of hitherto mysterious nature which takes place in my optic nerve or in my brain, is another thing, of which I am not at all conscious, and which scientific investigation alone could have apprised me of'

And his treatment of 'Perception' shows that he holds non-inferential knowledge of sensations to be exactly the same in kind as non-inferential knowledge of other 'mental phenomena'.

'Besides the affection of our bodily organs from without, and the sensation thereby produced in our minds, many writers admit a third link in the chain of phenomena, which they call a Perception, and which consists in the recognition of an external object as the exciting cause of the sensation. This perception, they say, is an *act* of the mind, proceeding

¹ p. 5, note

² p. 68

³ p. 57.

from its own spontaneous activity; while in a sensation the mind is passive, being merely acted upon by the outward object. And according to some metaphysicians, it is by an act of the mind, similar to perception, except in not being preceded by any sensation, that the existence of God, the soul, and other hyperphysical objects is recognised . . . In these so-called perceptions, or direct recognitions by the mind, of objects, whether physical or spiritual, which are external to itself, I can see only cases of belief; but of belief which claims to be intuitive, or independent of external evidence. When a stone lies before me, I am conscious of certain sensations which I receive from it, but if I say that these sensations come to me from an external object which I *perceive*, the meaning of these words is, that receiving the sensations, I intuitively *believe* that an external cause of those sensations exists.¹

Now this passage, while it shows that Mill holds non-inferential knowledge of sensations to be exactly the same in kind as non-inferential knowledge of other 'mental phenomena', seems also to betray a failure to accommodate non-inferential knowledge of any kind. Perception cannot be the 'direct knowledge' of 'our own bodily sensations' to which Mill's Introduction refers. It is direct enough, but it is not knowledge. 'In these so-called perceptions, or direct recognitions by the mind, of objects, whether physical or spiritual, which are external to itself, I can see only cases of belief.'² And Mill's admission is inevitable if the perception of a physical object 'consists in the recognition of an external object as the exciting cause of the sensation'³ and if, at the same time, a body is '(according to the more reasonable opinion) the unknown external cause, to which we refer our sensations'⁴. Now Mill also thinks that 'as our conception of a body is that of an unknown exciting cause of sensations, so our conception of a mind is that of an unknown recipient, or percipient, of them; and not of them alone, but of all our other feelings'⁵—that 'of the nature of either body or mind, further than the feelings which the former excites, and which the latter experiences, we do not, according to the best existing doctrine, know anything'.⁶ Accordingly, when Mill includes not only

¹ pp 57-8
⁶ p 69

² p 58.

³ p 57

⁴ p 68

⁵ Ibid

'physical' but also 'spiritual' objects among those in whose 'direct recognitions by the mind'¹ he 'can see only cases of belief', his reservation 'which are external to itself' makes an exception to which he is not entitled. And the claim 'I know directly, and of my own knowledge, that I was vexed yesterday, or that I am hungry to-day'² must be withdrawn. Not direct knowledge but only belief, preceded by direct knowledge, can be consistently claimed. And, perhaps, in giving 'our own bodily sensations and mental feelings' as 'truths known to us by immediate consciousness', and in speaking of 'present sensations, or other states of subjective consciousness'³ as 'facts known *per se*', Mill is actuated not by a mere regard for brevity but by a dim recognition that what he calls 'direct knowledge' is not cognition of truths or facts at all. 'When a stone lies before me, I am conscious of certain sensations which I receive from it; but if I say that these sensations come to me from an external object which I *perceive*, the meaning of these words is, that receiving the sensations, I intuitively *believe* that an external cause of those sensations exists.'⁴ But what *can* I say about them, or think about them, without plunging into the unknown? There is, on Mill's principles, no room for any non-inferential *knowledge that anything is the case*.

The same passage seems to show Mill's failure to grasp the notion of self-evidence. 'And according to some metaphysicians, it is by an act of the mind, similar to perception, except in not being preceded by any sensation, that the existence of God, the soul, and other hyperphysical objects is recognised.'⁵ Existential truths are, to put it mildly, not among the most convincing examples of self-evident truths. The most convincing examples are mathematical axioms, Mill's rejection of the self-evidence of which will come before us later. But, as Mill treats perception as 'belief which claims to be intuitive, or independent of external evidence',⁶ so he treats what purports to be *a priori* knowledge of the existence of God as belief differing from perception only 'in not being

¹ p. 58² p. 5³ p. 312.⁴ p. 58⁵ *Ibid*⁶ *Ibid*.

preceded by any sensation'. For, that it is what purports to be *a priori* knowledge that Mill has in mind, is shown by his reference in the Introduction to the question 'Whether God, and duty, are realities, the existence of which is manifest to us *a priori* by the constitution of our rational faculty'.¹ Now the comparison of the appeal to self-evidence with perception would be a misrepresentation of the rationalist position. Only the extreme epistemological rationalist claims that what is known only by perception is self-evident. It may be that experience is inadequate evidence for even the most rudimentary perceptual judgement. And we may look to 'the constitution of our rational faculty' to *supplement* experience. But the rejection of epistemological empiricism does not compel us to look to 'the constitution of our rational faculty' to *supplant* experience. If the only connexion between sensation and perception were that perception is always 'preceded by' sensation, perception might fairly be described as merely 'independent of external evidence'. But no merely negative description would do justice to the appeal to self-evidence. Intuitive knowledge is indeed 'independent of external evidence', but it is, unlike perceptual and introspective knowledge, dependent on internal evidence, evidence, that is, within the fact known.

But of non-inferential knowledge other than perception and introspection Mill has no positive conception. And perhaps it is to an incapacity even to entertain any alternative to epistemological empiricism that we must look, for the explanation of Mill's failure to recognize in his Introduction the controversial standpoint from which his *System of Logic* is written.

¹ p. 8.

CHAPTER II

SCOPE OF LOGIC

WHILE Mill's Introduction thus fails to introduce what I take to be the key to his *System of Logic*, my Introduction has so far failed to introduce the topic which engrosses his, the topic of the scope of logic. Mill says

'the definition which I am about to offer of the science of logic, pretends to nothing more, than to be a statement of the question which I have put to myself, and which this book is an attempt to resolve. The reader is at liberty to object to it as a definition of logic, but it is at all events a correct definition of the subject of these volumes'¹

It might therefore be felt that we have here to do with a statement which is not a proper subject for controversy. Mill ought to know what question he has put to himself. But (1) Mill does not remain loyal to this modest estimate of his definition. Not only in his *Examination of Sir William Hamilton's Philosophy* but also in his *System of Logic* he claims, in the words of the latter, 'Formal Logic, therefore, which Sir William Hamilton from his own point of view, and Archbishop Whately from his, have represented as the whole of Logic properly so called, is really a very subordinate part of it'² (2) Mill's definition rests on a confusion which makes the question which he professes to have put to himself an improper question. If his book really is 'an attempt to resolve' this improper question, the impropriety of the question may go far to explain the defects of the answer

Before introducing his own definition Mill examines first a definition which he finds too narrow and then a correction which he finds too wide. The definition which he finds too narrow takes *reasoning* to be the subject of logic. After distinguishing a narrower use of the word 'reasoning' which restricts it to 'syllogizing' and a wider use which makes 'reasoning' coextensive with 'inference' so that 'induction is as much entitled to be called reasoning as the demonstrations

of geometry',¹ Mill objects: 'But Reasoning, even in the widest sense of which the word is susceptible, does not seem to comprehend all that is included, either in the best, or even in the most current, conception of the scope and province of our science.' Mill's arguments fail to establish the relevance of this objection.

With the scholastic logicians 'in their systematic treatises, Argumentation was the subject only of the third part: the two former treated of Terms, and of Propositions; under one or other of which heads were also included Definition and Division'. Now what 'was the subject only of the third part' might easily have been nevertheless the quarry of the whole. And Mill even says: 'By some, indeed, these previous topics were professedly introduced only on account of their connexion with reasoning, and as a preparation for the doctrine and rules of the syllogism.' But he tries to justify the objection by complaining: 'Yet they were treated with greater minuteness, and dwelt on at greater length, than was required for that purpose alone.' The complaint is not impressive. Once it is admitted, as Mill does and must admit, that 'these previous topics' *are* connected with reasoning, to prescribe limits to the minuteness with which they need be treated or to the length at which they need be dwelt on for the purpose of grasping this connexion is a hazardous undertaking. Moreover, even if Mill's complaint were just, the objection which he founds on it might still be met. If logicians, professing to introduce certain topics 'only on account of their connection with reasoning', have made more of these topics than the professed purpose requires, it is better that other logicians who recognize this make less of these topics than that, disowning the limitations of the purpose originally put forward, they set out in search of a new principle of unity to cover the excess.

Mill's second argument can be intended only to strengthen his first. For the logician ought to 'conform to the practice of those who have made the subject their particular study'.² If their practice is also 'that of popular writers and common

¹ p 3² p 4

discourse', so much the better. If it is not, the logician ought to follow 'those who have made the subject their particular study' rather than 'popular writers and common discourse'. But even 'ordinary conversation' can be reconciled with the definition of the province of logic which Mill finds too narrow. 'Even in ordinary conversation, the ideas connected with the word Logic include at least precision of language, and accuracy of classification: and we perhaps oftener hear persons speak of a logical arrangement, or of expressions logically defined, than of conclusions logically deduced from premises' Now even to speak of 'conclusions logically deduced from premises' and to call a man 'a great logician, or a man of powerful logic' even 'for the accuracy of his deductions' is to use the word 'logic' in a derivative sense. What the logician calls 'valid' the layman calls 'logical', originally, perhaps, though probably only originally, with the meaning of 'such as the logician approves'. And if the logician, in his account of 'previous topics', approves certain modes of arrangement and certain modes of definition, no challenge to the definition which takes *reasoning* to be the subject of logic is to be extracted from the practice of speaking 'of a logical arrangement, or of expressions logically defined'.

Operations other than reasoning might be covered by defining logic 'as the science which treats of the operations of the human understanding in the pursuit of truth'.¹ Mill rightly pronounces this definition too wide. But he does not adequately correct it. To do so indeed would be to return to the definition which he has pronounced too narrow or rather to the still narrower definition of logic as the science of *valid* reasoning. Against defining logic 'as the science which treats of the operations of the human understanding in the pursuit of truth', Mill, after distinguishing, in a passage already examined, ultimate premisses from truths known by inference, rightly objects:

'With the original data, or ultimate premises of our knowledge; with their number or nature, the mode in which they are obtained, or the

¹ p 4

tests by which they may be distinguished; logic, in a direct way at least, has, in the sense in which I conceive the science, nothing to do. These questions are partly not a subject of science at all, partly that of a very different science.¹

But instead of being moved by this objection to define logic as the science of *valid* inference, Mill attempts a compromise: "The province of logic must be restricted to that portion of our knowledge which consists of inferences from truths previously known, whether those antecedent data be general propositions, or particular observations and perceptions. Logic is not the science of Belief, but the science of Proof, or Evidence. In so far as belief professes to be founded on proof, the office of logic is to supply a test for ascertaining whether or not the belief is well grounded. With the claims which any proposition has to belief on the evidence of consciousness, that is, without evidence in the proper sense of the word, logic has nothing to do."²

Again:

"The object of logic, as defined in the Introductory Chapter, is to ascertain how we come by that portion of our knowledge (much the greatest portion) which is not intuitive, and by what criterion we can, in matters not self-evident, distinguish between things proved and things not proved, between what is worthy and what is unworthy of belief."³

But the question whether a proposition is proved, the question, in other words, whether a proposition is known by inference, depends partly on whether an inference is valid and partly on whether the premisses of the inference are known. If, as Mill sees, it is beyond the scope of logic to investigate the knowledge of ultimate premisses, it follows that logic can investigate inference only to the extent of determining whether inferences are valid or invalid and without determining whether their conclusions are known or only truly, or even falsely, believed.

To the view that logic is concerned only with the validity of inference Mill's language occasionally conforms:

"It is in this sense that logic is, what it was so expressively called by the schoolmen and by Bacon, *ars artium*; the science of science itself. All science consists of data and conclusions from those data, of proofs and

¹ p. 6

² p. 8

³ p. 18

what they prove. now logic points out what relations must subsist between data and whatever can be concluded from them, between proof and everything which it can prove '¹

Granted, however, that the statements representing logic as concerned with the conditions of inferential knowledge rest on a confusion, the confusion is neither merely verbal nor merely momentary. It will not do to say that what Mill really means is that logic is concerned only with the validity of inference. For not only in his *Examination of Sir William Hamilton's Philosophy* but also in his *System of Logic* he champions the conception of a logic of Truth against the conception of a logic of mere Consistency, the conception of a logic which ascertains the conditions under which propositions are known by inference against the conception of a logic which ascertains merely the conditions under which propositions are validly inferred. After referring us to the *Examination* for the case against 'excluding, as irrelevant to Logic, whatever relates to Belief and Disbelief, or to the pursuit of truth as such, and restricting the science to that very limited portion of its total province, which has reference to the conditions, not of Truth, but of Consistency',² he says: 'For the purposes of the present Treatise, I am content that the justification of the larger extension which I give to the domain of the science, should rest on the sequel of the Treatise itself.' Since, as this appeal implies, the Logic of Consistency appears in Mill's *System of Logic* as a mere part of the Logic of Truth, this conception of logic must be examined.

The title 'Formal Logic' and the definition of logic as 'the science of the form of thought' I have no relish for defending. Science is, as such, formal; in other words, science concerns forms (universals). What the definition of any science should set before us is the question which distinguishes the forms which that science concerns. The question to which logic is the answer is: Under what conditions does p imply q ? Under what conditions is p inconsistent with \bar{q} ? Logical forms are those which are relevant to this question.

¹ p 9

² *Log*, p 14, n

Since neither the question of the truth or falsity of p nor the question of the truth or falsity of q considered independently of the truth or falsity of p (this reservation being required because p cannot imply q if it is the case both that q is false and that p is true) is relevant to the question whether p implies q , it is possible for an inference whose conclusion is true and an inference whose conclusion is false to agree entirely in logical form, in other words, to differ in no way relevant to the question to which logic is the answer. Hence the objection: 'Formal Logic abstracts from, is indifferent to, truth.' Now every science abstracts from, is indifferent to, some, even most, truth, all truth indeed except such as is relevant to the question to which the science is the answer. The objection would, accordingly, be frivolous unless associated with the contention that logic is concerned with truth, not only, as are all other sciences, because it investigates with a view to reaching a true answer to its question, but also, as is no other science, because what it investigates is nothing other than truth itself, its question being: Under what conditions is q true? To assign this question to logic is of course to deny to logic the right of abstracting from any truth. But is the logician really thus bound to choose between all and nothing? Can he not, like all other scientists, while abstracting from some truth still reserve other truth for his quarry? This brings us to the last stronghold of the objection: 'There is nothing else for logic to investigate. You may indeed set yourself the question: Under what conditions does p imply q ? But to answer this question, or, what is the same thing, the question: Under what conditions would q be true if p were? is only to give a defective answer to the question: Under what conditions is q true?' But now, even if we concede the equivalence of ' p implies q ' and ' q would be true if p were', and even if we admit that to say under what conditions this would be true would be to give a defective answer to the question: Under what conditions is q true? if it were to give an answer to that question at all, we must still insist that the answer may be a satisfactory answer to the question to which it professes to be an answer. To

assert 'If p then q ' is sometimes said to be to assert ' q ' conditionally, but is really to assert 'If p then q ' unconditionally. Nor is logic the only science to investigate the truth of composite propositions from the truth of whose component propositions it abstracts. Every mathematical proposition and every scientific law witnesses the contrary. And if it sounds odd to hear that the logician cares not whether his premisses be true or false, it sounds odd only because the premisses called 'his' are taken to be premisses *from* which, instead of premisses *concerning* which, he reasons.

There are passages in which Mill nearly brings against formal logic this objection that the logician, if he abstract from some, must abstract from all, truth.

'For the notion of true and false *will* force its way even into Formal Logic. . . . We may abstract from actual truth, but the validity of reasoning is always a question of conditional truth—whether one proposition must be true if others are true, or whether one proposition can be true if others are true'¹

Mill seems here not to see that the question of the validity of reasoning is a question of 'actual' truth, though truth not of the conclusion of the reasoning but of the proposition asserting that the premiss implies the conclusion.

'The most important, then, and at bottom the only important quality of a thought being its truth, the laws or precepts provided for the guidance of thought must surely have for their principal purpose that the products of thinking shall be true. Yet with this, according to Mr. Mansel, Logic has no concern; and Sir W. Hamilton reserves it for a sort of appendix to the science, under the title of Modified Logic. Questions of truth and falsity, according to both writers, regard only Material Thinking, while Formal Thinking is the province of Logic. The only precepts for thinking with which Logic concerns itself, are those which have some other purpose than the conformity of our thoughts to the fact. Yet every possible precept for thought, if it be an honest one, must have this for at least its ultimate object.'²

But to say "The only precepts for thinking with which Logic concerns itself, are those which have some other purpose than the conformity of our thoughts to the fact" and to represent

¹ *Exam*, p. 456.

² *Ibid.*, pp. 454-5.

this as the doctrine which he is attacking is to ignore facts of the form: p implies q . Despite such passages I am inclined to pay Mill the compliment of saying that he leaves this objection for later critics of formal logic. Mill himself brings neither this nor any other objection against formal logic. Both in his *Examination of Sir William Hamilton's Philosophy* and in his *System of Logic* he concedes, in the words of the latter, 'The Logic of Consistency is a necessary auxiliary to the logic of truth'.¹ He concedes even, in the words of the former, 'the scientific convenience of considering this limited portion of Logic apart from the rest'.²

Mill's objection is not against formal logic but against the representation of formal logic as the whole of logic.

'What I protest against, is the doctrine of Sir W. Hamilton, Mr. Mansel, and many other thinkers, that this part is the whole, that there is no other Logic, or Pure Logic, at all; that whatever is more than this, belongs not to a general science and art of Thinking, but (in the words of Mr. Mansel) to this or that material science

'This doctrine assumes, that with the exception of the rules of Formal, that is, of Syllogistic Logic, no other rules can be framed which are applicable to thought generally, abstractedly from particular matter: That a general theory is possible respecting the relations which the parts of a process of thought should bear to one another, but not respecting the proper relations of all thought to its matter. That the problem which Bacon set before himself, and led the way towards resolving, is an impossible one. That there is not, and cannot be, any general Theory of Evidence. That when we have taken care that our notions and propositions concerning Things shall be consistent with themselves and with one another, and have drawn no inferences from them but such the falsity of which would be inconsistent with assertions already made, we have done all that a philosophy of Thought can do—and the agreement and disagreement of our beliefs with the laws of the thing itself, is in each case a special question, belonging to the science of that thing in particular.'³

This protest introduces topics which confuse the issue. Syllogistic logic may not be the whole of formal logic. The 'problem which Bacon set before himself, and led the way towards resolving', according to Mill⁴ the problem of 'Induc-

¹ p. 240² p. 461³ *Exam*, p. 457⁴ *Log*, p. 361

tion', may belong to formal logic, and, if indeed induction is a type of valid inference, *must* belong to formal logic. What Mill has to show is not that there are types of valid inference which formal logicians have failed to detect but that the answer, however ambitious, to the question: Under what conditions does p imply q ? is only part of logic.

It is the irrelevantly introduced topics, however, that are the key to Mill's position. His real quarrel is not, and it is only through a confusion that he thinks it is, with the conception of logic as exhausted by the logic of consistency. His real quarrel is with the mismanagement of the logic of consistency, with the failure to detect any but *verbal* inconsistencies. The operations which the orthodox logician takes for valid inferences being merely verbal transformations, real inferences being mistaken by the orthodox logician for invalid inferences, the defect of the orthodox logic is not its refusal, by guaranteeing ultimate premisses, to guarantee conclusions, but its failure to get out of premisses all that can be got. Now more can be got only if more is implied, only if, in other words, there are more propositions whose contradictories are inconsistent with the premisses. The remedy, therefore, is, not to transcend the logic of consistency, but so to conduct the logic of consistency as to detect inconsistency where the orthodox logician has missed it.

Let us try to verify this interpretation of Mill's position.

'If thought be anything more than a sportive exercise of the mind, its purpose is to enable us to know what can be known respecting the facts of the universe its judgments and conclusions express, or are intended to express, some of those facts and the connexion which Formal Logic, by its analysis of the reasoning process, points out between one proposition and another, exists only because there is a connexion between one objective truth and another, which makes it possible for us to know objective truths which have never been observed, in virtue of others which have This possibility is an eternal mystery and stumbling-block to Formal Logic. The bare idea that any new truth can be brought out of a Concept—that analysis can ever find in it anything which synthesis has not first put in—is absurd on the face of it, yet this is all the explanation that Formal Logic, as viewed by Sir W. Hamilton, is able to give

of the phenomenon, and Mr Mansel expressly limits the province of Logic to analytic judgments—to such as are merely identical. But what the Logic of mere consistency cannot do, the Logic of the ascertainment of truth, the Philosophy of Evidence in its larger acceptation, can.¹

What Mill in this passage recommends is a logic capable of explaining how it is 'possible for us to know objective truths which have never been observed, in virtue of *others* which have', how *q* can be validly inferred from *p* where the judgment that *either \bar{p} or *q** is not 'analytic', not 'merely identical'. But, if the logic which he recommends can, while the orthodox logic cannot, explain this, the orthodox logic ought to be distinguished not as a logic of mere consistency but as a logic of merely *verbal* consistency, and the logic which Mill recommends ought to be distinguished not as a logic of truth but as a logic of *real* consistency. It is relevant to observe that in connexion with his statement that Hamilton 'is entitled to no authority when he denies the possibility of a Philosophy of Evidence and of the Investigation of Nature; inasmuch as his own acquirements do not furnish him with the means of judging whether it is possible or not', Mill says: 'The point of view of a complete Induction, namely one in which the nature of the instances is such, that *no other result than the one arrived at is consistent with* the universal Law of Causation, had never risen above Sir W. Hamilton's horizon.'²

'The preceding considerations enable us to understand the true nature of what is termed, by recent writers, Formal Logic, and the relation between it and Logic in the widest sense. Logic, as I conceive it, is the entire theory of the ascertainment of reasoned or inferred truth. Formal Logic, therefore, which Sir William Hamilton from his own point of view, and Archbishop Whately from his, have represented as the whole of Logic properly so-called, is really a very subordinate part of it, not being directly concerned with the process of Reasoning or Inference in the sense in which that process is a part of the Investigation of Truth. What, then, is Formal Logic? The name seems to be properly applied to all that portion of doctrine which relates to the equivalence of different modes of expression.'³

¹ *Exam*, pp 461-2.

³ *Log.*, pp. 238-9.

² *Ibid.*, p. 459, note. My italics

The difference between merely apparent and real inference is here confused with the difference between merely valid inference and inferential knowledge. An inference must have a premiss and a conclusion. It is one thing to demand that the conclusion differ from the premiss in an assigned way, to insist, in particular, that the assertion of the premiss be not the assertion of the conclusion. It is another thing to demand that inference be from a known premiss. No reform of the orthodox logician's account of the relation between premiss and conclusion can make logic 'the entire theory of the ascertainment of reasoned or inferred truth'.

CHAPTER III

CONNOTATIVE AND NON-CONNOTATIVE NAMES

SINCE the distinction between real and merely apparent inference, in terms of which, in Book II, 'Of Reasoning', Mill expounds and defends the central thesis of his *System of Logic*, is a specification of his distinction between real and merely verbal propositions, Mill is, and would be even if other logicians were not, under 'the necessity of commencing with an analysis of language'. Mill's distinction between real and merely verbal propositions depends, in turn, on his doctrine of the connotation of names. For this reason Book I, which provides such analysis of language as Mill finds necessary, treats, and in this order, 'Of Names and Propositions'. And it is in unacknowledged deference to the demands of Mill's central thesis that Chapter II, 'Of Names', is engrossed with the 'division of names, into *connotative* and *non-connotative*'.¹

Over Mill's conspicuously unsuccessful attempt to define 'connote' it is unnecessary to linger.

In the first place, Cook Wilson² long ago raised all, and perhaps more than all, the objections which can be fairly brought against what Mill says. Mill has the misfortune to allow himself unguardedly to speak of a name as 'implying' and as 'signifying indirectly' what it connotes:

'What we call men, are the subjects, the individual Stiles and Nokes, not the qualities by which their humanity is constituted. The name ["man"], therefore, is said to signify the subjects *directly*, the attributes *indirectly*; it *denotes* the subjects, and implies, or involves, or indicates, or as we shall say henceforth *connotes*, the attributes.'³

Mill is plainly influenced, in this definition, by the consideration that a name is ordinarily said 'to be the name of' what it denotes, not what it connotes. He may be influenced also by the consideration that a name is frequently used for the sake

¹ p 31

³ p 32.

² *Statement and Inference*, vol 1, pp 386-403.

of what it denotes, its connotation being then treated only as a means to an end. But more important than any explanation of Mill's decision to venture upon this definition is the recognition that Mill himself warns us against relying on it. For, in defending his selection of the word 'connote', he says:

'I am unable to find any expression to replace it, but such as are commonly employed in a sense so much more general, that it would be useless attempting to associate them peculiarly with this precise idea. Such are the words, to involve, to imply, &c By employing these, I should fail of attaining the object for which alone the name is needed, namely, to distinguish this particular kind of involving and implying from all other kinds, and to assure to it the degree of habitual attention which its importance demands'¹

And how far the definition is from being a fair sample may be seen by contrasting:

'From the preceding observations it will easily be collected, that whenever the names given to objects convey any information, that is, whenever they have properly any meaning, the meaning resides not in what they *denote*, but in what they *connote*'²

'A bird or a stone, a man, or a wise man, means simply, an object having such and such attributes The real meaning of the word man, is those attributes, and not Smith, Brown, and the remainder of the individuals'³

'The distinction between an abstract term and its corresponding concrete, does not turn upon any difference in what they are appointed to signify, for the real signification of a concrete general name is, as we have so often said, its connotation'⁴

'In the case of connotative names, the meaning, as has been so often observed, is the connotation'⁵

'But though it is true that we naturally "construe the subject of a proposition in its extension", this extension, or in other words, the extent of the class denoted by the name, is not apprehended or indicated directly. It is both apprehended and indicated solely through the attributes'⁶

In the second place, Dr. J. N. Keynes,⁷ by distinguishing connotation from what he called 'comprehension' and from what he called 'subjective intension', long ago paved the way

¹ p. 42, note.

² p. 36.

³ p. 102

⁴ p. 118.

⁵ p. 152.

⁶ p. 109, note.

⁷ *Formal Logic*, 4th ed., pp. 23-7, 40-1.

28 CONNOTATIVE AND NON-CONNOTATIVE NAMES

towards the definition which Mill vainly sought. The distinctions which Keynes formulates may fairly be said to be at least implicitly recognized by Mill:

'When we predicate of anything its proper name, when we say, pointing to a man, this is Brown or Smith, or pointing to a city, that it is York, we do not, merely by so doing, convey to the reader any information about them, except that those are their names. By enabling him to identify the individuals, we may connect them with information previously possessed by him, by saying, This is York, we may tell him that it contains the Minster. But this is in virtue of what he has previously heard concerning York; not by anything implied in the name. It is otherwise when objects are spoken of by connotative names. When we say, The town is built of marble, we give the hearer what may be entirely new information, and this merely by the signification of the many-worded connotative name, "built of marble".'¹

To this passage Mr. Joseph, in objecting against Mill's statement, 'A proper name is but an unmeaning mark',¹ does less than justice:

'And not only, to anyone who knows of what individual it is the name, has a proper name meaning, but it has more meaning than a general term. The cry "man overboard" would have conveyed to Aeneas and his companions not more but less information than the cry "Palinurus overboard". It cannot indeed convey to any one, for he cannot know, the whole character of the individual denoted, but it excludes from its meaning designedly nothing of that character; whereas another term, if it is not the name of an *infima species* of attributes, is designedly confined to signifying only some determinate character in what it denotes.'²

But the cry 'Helmsman overboard' would have conveyed no less information than the cry 'Palinurus overboard'. And, if the intended communication which the use of 'helmsman' may subserve goes beyond the meaning of 'helmsman', beyond the 'determinate character in what it denotes' which 'helmsman' is 'designedly confined to signifying', then the bare consideration that the use of 'Palinurus' may subserve an ample intended communication does not suffice to show that it has *much* meaning, nor even that it has *any* meaning.

Mill would concede Mr. Joseph's premiss. But Mill would

¹ *Log*, p. 37

² *An Introduction to Logic*, 2nd ed., pp 151-2.

reply that the cry 'Palinurus overboard' would have conveyed to Aeneas and his companions more information than the cry 'man overboard' only in virtue of what they already knew concerning Palinurus—that, by enabling them to identify the individual, the cry 'Palinurus overboard' would have connected the name 'Palinurus' with information previously possessed by them. What is the nature of this antecedent information? What information must be 'previously possessed' by the hearer if 'by saying, This is York' we are to 'tell him that it contains the Minster'? The prerequisite information is that the name 'York' is truly applicable to what contains, falsely applicable to what does not contain, the Minster. But the name is non-connotative. A name, then, need not connote a character although the name is truly applicable to whatever possesses, and falsely applicable to whatever lacks, the character. A name connotes a character if and only if the name would be truly applicable to whatever possessed the character regardless of the absence, and would be falsely applicable to whatever lacked the character regardless of the presence, of all other characters. The name 'three-sided figure' connotes three-sidedness but does not connote three-angledness.

Adopting this definition, we can accept Mill's doctrine that proper names and most abstract names are non-connotative. His doctrine that 'all concrete general names are connotative'¹ is more questionable. Only many-worded names and technical terms seem to satisfy the definition. But this is a reason for modifying rather the doctrine than the definition. The doctrine that such names as 'man' are connotative is a case of what may be called 'the logical fallacy'—the treatment of language as what the logician would like it to be. And I believe that Mill himself points the way to a profound modification of the doctrine. In order to understand the sequel, however, we shall have to remark, not Mill's commendable disloyalty to his doctrine of connotatives, but his regrettable disloyalty to his doctrine of non-connotatives.

¹ *Log*, p. 32

CHAPTER IV

PROPOSITIONS—THE GHOST OF NOMINALISM

TO the contents of Chapter v, 'Of the Import of Propositions', Mill's retrospective survey is a misleading guide:

'In the course of this preliminary investigation into the import of Propositions, we examined the opinion of the Conceptualists, that a proposition is the expression of a relation between two ideas, and the doctrine of the extreme Nominalists, that it is the expression of an agreement or disagreement between the meanings of two names. We decided that, as general theories, both of these are erroneous, and that, though propositions may be made both respecting names and respecting ideas, neither the one nor the other are the subject-matter of Propositions considered generally. We then examined the different kinds of Propositions.'¹

Mill's decision that 'as general theories' both Conceptualism and Nominalism 'are erroneous' is here represented as leading him not to champion any alternative general theory but to examine 'the different kinds of Propositions'. It looks, moreover, as if Mill would be right in rejecting all 'general theories'. For what *could* be 'the subject-matter of Propositions considered generally'?

Different propositions, indeed, not only *may* differ in import. If the identity of a proposition is unimpaired by mere vocal and graphic diversity, different propositions *must* differ in import. At the same time, however, there must be something common to the imports of all propositions, something which makes them propositions rather than, for example, questions or commands. The question, What a proposition is, is the question, What this element common to the imports of all propositions is.

The expectation of an answer to this question would be justified by the title 'The Import of *the* Proposition' and even by the title 'The Import of *a* Proposition'. The title of Chapter

v, however, is less committal. The title 'Of the Import of Propositions' might be held appropriate equally to an answer to the question concerning the element common to the imports of all propositions and to an answer to the obviously different but obviously connected question concerning the ways in which propositions may differ in import. But by proposing to inquire 'What is the immediate object of belief in a Proposition? What is the matter of fact signified by it? What is it to which, when I assert the proposition, I give my assent, and call upon others to give theirs? What is that which is expressed by the form of discourse called a Proposition, and the conformity of which to fact constitutes the truth of the proposition?'¹ Mill clearly undertakes at least to *consider* the question concerning the element common to the imports of all propositions. And his representation of Hobbes's view, 'In every proposition what is signified is, the belief of the speaker that the predicate is a name of the same thing of which the subject is a name',² as an 'answer to this question' decisively confirms this interpretation. But to consider a question is not to answer it. A consideration of the question concerning the element common to all propositions might lead Mill to conclude that the question ought not to be asked, and he might in consequence proceed, as his retrospective survey represents him as proceeding, directly from a rejection of certain erroneous answers to this question to an acceptance of an answer to the different question concerning the ways in which propositions may differ in import. This interpretation, however, is clearly forbidden by Mill's table of contents, where Chapter v is represented as not only giving an account of a number of doctrines concerning what a proposition is but also, in § 4, telling us 'what it really is'.

An important part of the explanation of these conflicting representations of the contents of Chapter v is to be found in an imperfect grasp of the difference between the two questions: 'We found that whatever be the form of the proposition, and whatever its nominal subject or predicate, the real subject of every proposition is

¹ p. 99

² Ibid

some one or more facts or phenomena of consciousness, or some one or more of the hidden causes or powers to which we ascribe those facts; and that what is predicated or asserted, either in the affirmative or negative, of those phenomena or those powers, is always either Existence, Order in Place, Order in Time, Causation, or Resemblance. This, then, is the theory of the Import of Propositions, reduced to its ultimate elements but there is another and a less abstruse expression for it, which, though stopping short in an earlier stage of the analysis, is sufficiently scientific for many of the purposes for which such a general expression is required. This expression recognises the commonly received distinction between Subject and Attribute, and gives the following as the analysis of the meaning of propositions —Every Proposition asserts, that some given subject does or does not possess some attribute; or that some attribute is or is not (either in all or in some portion of the subjects in which it is met with) conjoined with some other attribute.¹

What Mill here calls 'the theory of the Import of Propositions, reduced to its ultimate elements' is really an answer to the question concerning the ways in which propositions may differ in import. What he here calls 'another and a less abstruse expression for it, which, though stopping short in an earlier stage of the analysis, is sufficiently scientific for many of the purposes for which such a general expression is required' is what his table of contents treats as an answer to the question what a proposition is. The failure of Mill's retrospective survey of the contents of Chapter v to record his acceptance of any general theory may easily be another instance of this confusion of an answer to the question concerning an element common to the imports of all propositions with 'another and a less abstruse expression for' an answer to the question concerning the ways in which propositions may differ in import.

But *is* what Mill offers in § 4 of Chapter v an answer to the question what a proposition is? Or is it an answer to the question concerning the ways in which propositions may differ in import?

It is the product of an examination of Nominalism. And here again Mill's retrospective survey of the contents of

¹ pp. 179-80.

Chapter v is a misleading guide. For his retrospective survey represents him as conceding to Nominalism and Conceptualism only the indisputable fact that 'propositions may be made both respecting names and respecting ideas'.¹ But Chapter v concedes to Nominalism much more than this. Hobbes's analysis 'is the only analysis that is rigorously true of all propositions without exception. What he gives as the meaning of propositions, is part of the meaning of all propositions, and the whole meaning of some.'² Of the two concessions which Mill here makes only the concession that what Hobbes gives is 'part of the meaning of all propositions' may seem disputable, and the concession that what Hobbes gives is 'the whole meaning of some' may seem identical with the indisputable fact that propositions may be made respecting names. Really, however, neither concession is recognized in Mill's retrospective survey, and both concessions are disputable and, as I hope to show, mistaken.

The doctrine to which the two concessions are made is formulated thus:

'In every proposition (says he) what is signified is, the belief of the speaker that the predicate is a name of the same thing of which the subject is a name, and if it really is so, the proposition is true. Thus the proposition, All men are living beings (he would say) is true, because *living being* is a name of everything of which *man* is a name. All men are six feet high, is not true, because *six feet high* is not a name of everything (though it is of some things) of which *man* is a name'³

Disregarding, as Mill disregards, the words 'the belief of the speaker', we may reformulate the doctrine, so far as universal categorical propositions are concerned, thus: Where 'A' and 'B' are any two names, the sentence 'Every A is a B' has the same meaning as the sentence "'B" is a name of everything of which "A" is a name' or as the sentence 'Everything denoted by "A" is denoted by "B"'. The important difference between the concession that what Hobbes gives is the whole meaning of some propositions and the indisputable fact that propositions may be made respecting names is now

¹ p 122.
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² p 100
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³ pp 99-100

easily seen. Once the formulation of Nominalism as the doctrine that every proposition 'is the expression of an agreement or disagreement between the meanings of two names'¹ is supplemented by the qualification that the two names are the subject and the predicate of the proposition, not only the concession that every proposition is *this among other things*, but also the concession that some propositions are *only this*, is easily seen to be disputable. Nor can one fail to suspect that both concessions are at bottom the *same* mistake.²

Let us look first at the concession that what Hobbes gives is 'part of the meaning of all propositions'. 'What is stated in this theory as the definition of a true proposition, must be allowed to be a property which all true propositions possess. The subject and predicate being both of them names of things, if they were names of quite different things the one name could not, consistently with its signification, be predicated of the other.'³ So far I do not dissent. A measure (according to quantity) of agreement or disagreement (according to quality) between the denotation of the verbal predicate and that of the verbal subject may be conceded to be 'a property which all true propositions possess'. Moreover, a speaker may fairly be said *tacitly* to claim that the symbols which he selects are appropriate to his intended communication, and, if he is asserting, he may fairly be said *tacitly* to claim that his assertion is true. My protest is only that such claims *are* tacit, not symbolized, not asserted. 'If it be true that some men are copper-coloured, it must be true—and the proposition does really assert—that among the individuals denoted by the name man, there are some who are also among those denoted by the name copper-coloured.'⁴ I want here only to reject the

¹ p. 122

² Where 's' is any true or false sentence, *whether s* depends not at all on *what 's' symbolizes*, but *whether 's' is true* depends partly on *what 's' symbolizes* and depends for the rest on *whether s*. Mill's two concessions to Nominalism may be formulated independently of the subject-predicate analysis as (1) that *whether s* is always at least partly dependent on *what 's' symbolizes* (2) that *whether s* is sometimes wholly dependent on *what 's' symbolizes*. The fundamental mistake is the failure to distinguish *whether s* from *whether 's' is true*. Whately makes the same mistake (*Elements of Logic*, IV IV, § 1). Who does not?

³ p. 100.

⁴ Ibid.

parenthesis and liberally to besprinkle the remainder with inverted commas. Similarly, while conceding that 'if it be true "that all oxen ruminate", it must be true that all the individuals denoted by the name "ox" are also among those denoted by the name (?) "ruminating"',¹ I deny that 'whoever asserts that all oxen ruminate, undoubtedly does assert that this relation subsists between the two names'.

Let us turn to the concession that what Hobbes gives is 'the whole meaning of some' propositions

'The only propositions of which Hobbes' principle is a sufficient account, are that limited and unimportant class in which both the predicate and the subject are proper names. For, as has already been remarked, proper names have strictly no meaning; they are mere marks for individual objects and when a proper name is predicated of another proper name, all the signification conveyed is, that both the names are marks for the same object. But this is precisely what Hobbes produces as a theory of predication in general. His doctrine is a full explanation of such predications as these: Hyde was Clarendon, or, Tully is Cicero. It exhausts the meaning of those propositions. But it is a sadly inadequate theory of any others. That it should ever have been thought of as such, can be accounted for only by the fact, that Hobbes, in common with the other Nominalists, bestowed little or no attention upon the *connotation* of words, and sought for their meaning exclusively in what they *denote*. as if all names had been (what none but proper names really are) marks put upon individuals, and as if there were no difference between a proper and a general name, except that the first denotes only one individual, and the last a greater number.

'It has been seen, however, that the meaning of all names, except proper names and that portion of the class of abstract names which are not connotative, resides in the connotation. When, therefore, we are analysing the meaning of any proposition in which the predicate and the subject, or either of them, are connotative names, it is to the connotation of those terms that we must exclusively look, and not to what they *denote*, or in the language of Hobbes (language so far correct) are names of.'²

We may begin by observing an obvious inaccuracy. 'The only propositions of which Hobbes' principle is a sufficient account, are that limited and unimportant class in which both

¹ Inverted commas mine

² p. 101.

the predicate and the subject are proper names.' Again, 'it is a sadly inadequate theory of any others.' But no reason whatever is given for discriminating as 'propositions of which Hobbes' principle is a sufficient account' those 'in which both the predicate and the subject are proper names', except that proper names are non-connotative. Clearly what Mill intends to concede to Nominalism is that it is a sufficient account of all propositions in which both the predicate and the subject are non-connotative names. But, according to Mill's account of the division of names into connotative and non-connotative, while proper names are the only non-connotative *concrete* names, the *connotative abstract* name is rather the exception than the rule. 'Even abstract names, though the names only of attributes, may in some instances be justly considered as connotative; for attributes themselves may have attributes ascribed to them, and a word which denotes attributes may connote an attribute of those attributes.'¹ Now Mill may simply have forgotten abstract names. But his tardy and somewhat grudging reference to 'that portion of the class of abstract names which are not connotative'² suggests that he wants, in studying the import of propositions whose terms are non-connotative names, to simplify discussion by taking proper names as adequately typical of non-connotative names. And against this there is no objection, provided that it is clearly understood that proper names are taken only as typical of non-connotative names. But it is just this that Mill does *not* clearly understand. For his concession to Nominalism involves the position that the proper name, instead of being non-connotative, connotes *the being denoted by itself*.³

¹ p 33² p 101

³ This position, that 'Brown', for example, connotes *the being denoted by 'Brown'*, has some plausibility. It is plausible that 'This is Brown' agrees in meaning with 'This is denoted by "Brown"'. But, although I defended this position some years ago (*Mind*, 1933), I have since become convinced of its untenability. A name connotes a character if and only if the name would denote whatever possessed the character regardless of the absence, and would not denote whatever lacked the character regardless of the presence, of every other character. But, that 'Brown' would denote whatever was denoted by 'Brown' and would not denote whatever was not denoted by 'Brown', is not a truth but a tautology.

This position is indeed anticipated even in Mill's defence of the thesis that proper names are non-connotative: 'When we predicate of anything its proper name; when we say, pointing to a man, this is Brown or Smith, or pointing to a city, that it is York, we do not, merely by so doing, convey to the reader any information about them, *except that those are their names*.'¹ And now in support of the concession that Hobbes's principle is a sufficient account of propositions 'in which both the predicate and the subject are proper names' Mill in effect argues that just because the proper name is non-connotative it connotes *the being denoted by itself*. 'For, as has already been remarked, proper names have strictly no meaning; they are mere marks for individual objects: and when a proper name is predicated of another proper name, all the signification conveyed is, that both the names are marks for the same object.'² That no *other* signification is conveyed, that nothing *else* is asserted, does, but that even this is conveyed or asserted does not, square with the position that proper names are non-connotative. Again, Hobbes's doctrine 'exhausts the meaning of those propositions'. No doubt the doctrine misses nothing of their meaning. But have they any meaning to be missed? The sentence 'Tully is Cicero' is here treated as having the same meaning as the sentence 'The name "Cicero" is a name of that of which the name "Tully" is a name', or the sentence 'The subject denoted by the name "Tully" is the subject denoted by the name "Cicero"'. If, however, we are to be loyal to the position that proper names are non-connotative, meaningless marks, we must diagnose 'Tully is Cicero' as not a sentence at all. It consists of the word 'is' and two meaningless marks. A many-worded symbol cannot be framed of such materials.

While Mill here concedes to Nominalism that, where we have to do with non-connotative names, we rightly seek 'for their meaning exclusively in what they *denote*', he protests against Nominalism that, when 'we are analysing the meaning of any proposition in which the predicate and the subject, or

¹ p 37 *Italics mine*

² p 101

either of them, are connotative names, it is to the connotation of those terms that we must exclusively look, and not to what they *denote*'. But his protest cancels his concession that what Hobbes 'gives as the meaning of propositions, is part of the meaning of all propositions'. What Mill ought to say, if this concession is to stand, is not that 'it is to the connotation of those terms that we must exclusively look, and not to what they *denote*', but that we must look to their connotation as well as to their denotation, or rather that we must treat the connotative name as connoting the conjunction of what it alone seems to connote with *the being denoted by itself*. And in his account of propositions in which both predicate and subject are connotative Mill does in effect say this among other things.

Holding that the import of the proposition varies according as its subject and predicate are connotative or non-connotative names, Mill ought to distinguish four types of proposition: (i) subject non-connotative, predicate connotative; (ii) both subject and predicate non-connotative; (iii) both subject and predicate connotative; (iv) subject connotative, predicate non-connotative. Of these four types, however, (iv) may—especially by those who hold that all concrete general names are connotative—with some plausibility be represented as a merely rhetorical variant of (i). Mill at any rate ignores (iv). His account, in § 2, of (ii) has already been examined. His account of (i) and (iii) is given in § 4.

As an illustration of (i) Mill by a curious oversight offers the sentence 'The summit of Chimborazo is white'.¹ He even introduces the illustration with the proposal, 'let the subject be a proper name'. And in what follows he proceeds, in spite of his earlier recognition that, contrasted with proper names, 'there is another kind of names, which, although they are individual names, that is, predicable only of one object, are really connotative',² as if the distinction between (i) and (iii) were coincident with the distinction between singular and general propositions. Of the proposition that the summit of Chimborazo is white, the meaning is said to be 'that the

¹ p. 108² p. 34.

individual thing denoted by the subject, has the attributes connoted by the predicate'.¹ As an illustration of (iii) Mill offers, not surprisingly, the sentence 'All men are mortal'.² And he begins by treating the name 'man' as if it connoted a conjunction of characters including *the being denoted by the name*. For he says: 'In this case, as in the last, what the proposition asserts (or expresses a belief of) is, of course, that the objects denoted by the subject (man) possess the attributes connoted by the predicate (mortal).' But he at once abandons even this partial preservation of the concession that what Hobbes gives is part of the meaning of all propositions:

'But the characteristic of this case is, that the objects are no longer *individually* designated. They are pointed out only by some of their attributes: they are the objects called men, that is, possessing the attributes connoted by the name man, and the only thing known of them may be those attributes. Indeed, as the proposition is general, and the objects denoted by the subject are therefore indefinite in number, most of them are not known individually at all. The assertion, therefore, is not, as before, that the attributes which the predicate connotes are possessed by any given individual, or by any number of individuals previously known as John, Thomas, &c, but that those attributes are possessed by each and every individual possessing certain other attributes; that whatever has the attributes connoted by the subject, has also those connoted by the predicate; that the latter set of attributes *constantly accompany* the former set. Whatever has the attributes of man has the attribute of mortality; mortality constantly accompanies the attributes of man.'³

That this abandonment of the concession is not due merely to Mill's momentary preoccupation with the difference between singular and general propositions may be seen by comparing the last paragraph of § 2:

'A bird or a stone, a man, or a wise man, means simply, an object having such and such attributes. The real meaning of the word man, is those attributes, and not Smith, Brown, and the remainder of the individuals. The word *mortal*, in like manner connotes a certain attribute or attributes; and when we say, All men are mortal, the meaning of the proposition is, that all beings which possess the one set of attributes, possess

¹ p. 108.

² *Ibid*

³ pp. 108-9.

also the other. If, in our experience, the attributes connoted by *man* are always accompanied by the attribute connoted by *mortal*, it will follow as a consequence, that the class *man* will be wholly included in the class *mortal*, and that *mortal* will be a name of all things of which *man* is a name but why? Those objects are brought under the name, by possessing the attributes connoted by it. but their possession of the attributes is the real condition on which the truth of the proposition depends, not their being called by the name.¹

And of the proposition, that the diamond is combustible, Mill says.

'The assertion, therefore, when analysed, is, that wherever we find certain attributes, there will be found a certain other attribute which is not a question of the signification of names, but of laws of nature; the order existing among phenomena '²

But, if the assertion is *exhaustively* analysable into something which is not a question of the signification of names, what Hobbes 'gives as the meaning of propositions' is *not* 'part of the meaning of all propositions'.

¹ p. 102.

² p. 103

CHAPTER V

MERELY VERBAL PROPOSITIONS

THE relation of Chapter vi, 'Of Propositions merely Verbal', to Chapter v, 'Of the Import of Propositions', is intelligibly presented in § 1 of the former. Merely verbal propositions having been already in Chapter v distinguished from propositions which are not merely verbal, and propositions which are not merely verbal having been already there examined, Mill proposes to devote a separate chapter to an examination of merely verbal propositions. He gives a reason for supposing that merely verbal propositions are worthy of special study:

'If all propositions respecting the signification of words were as simple and unimportant as those which served us for examples when examining Hobbes' theory of predication, viz those of which the subject and predicate are proper names, and which assert only that those names have, or that they have not, been conventionally assigned to the same individual, there would be little to attract to such propositions the attention of philosophers. But the class of merely verbal propositions embraces not only much more than these, but much more than any propositions which at first sight present themselves as verbal, comprehending a kind of assertions which have been regarded not only as relating to things, but as having actually a more intimate relation with them than any other propositions whatever. The student in philosophy will perceive that I allude to the distinction on which so much stress was laid by the schoolmen, and which has been retained either under the same or under other names by most metaphysicians to the present day, viz between what were called *essential*, and what were called *accidental*, propositions, and between essential and accidental properties or attributes'¹

The main business of Chapter vi is, accordingly, a vindication of Locke's doctrine of Nominal Essences, the doctrine, namely, that the distinction between essence and accident, where the word 'essence' is taken in its narrower sense to exclude propria and the word 'accident' is taken in its wider sense to include propria (as Mill notices²) is nothing but

¹ p 123

² p 147

a misconception of the distinction between connoted and unconnoted characters of what a name denotes.

Mill has, further, a reason which he does not give for devoting special attention to the merely verbal propositions which have been called 'essential' by philosophers who have failed to see that they are merely verbal. It is this kind of merely verbal proposition that is the nerve of merely apparent inference.

So far there is no difficulty. But as he proceeds Mill allows himself to become so absorbed in the task of showing that what have been called 'essential propositions' are merely verbal propositions that he forgets that they are not on his own view the only merely verbal propositions. His forgetfulness appears not only in his exclusive attention to this kind of merely verbal propositions. That might be justified by the consideration that the only other merely verbal propositions have been already treated in Chapter v, although the failure to raise the important and difficult question of what it is that is common to the two kinds and what it is that is peculiar to each could not be thus justified. But Mill explicitly asserts that 'essential propositions' are the only merely verbal propositions:

'An essential proposition, then, is one which is purely verbal; which asserts of a thing under a particular name, only what is asserted of it in the fact of calling it by that name; and which therefore either gives no information, or gives it respecting the name, not the thing. Non-essential, or accidental propositions, on the contrary, may be called Real Propositions, in opposition to Verbal. They predicate of a thing some fact not involved in the signification of the name by which the proposition speaks of it; some attribute not connoted by that name.'

Further, 'Such are all propositions concerning things individually designated.' And, 'According to the above view of essential propositions, no proposition can be reckoned such which relates to an individual by name, that is, in which the subject is a proper name. Individuals have no essences.'² It would follow that no proposition 'in which the subject is a

¹ p. 129.

² p. 127.

proper name' could be a merely verbal proposition. Yet it is obvious that the propositions belonging to 'that limited and unimportant class in which both the predicate and the subject are proper names'¹ have a strong claim, if 'Hobbes' principle is a sufficient account' of them, as Mill thinks it is, to be included in the class of merely verbal propositions. Moreover, Mill has included them in the class, not only by implication in Chapter v,² but also explicitly in § 1 of Chapter vi. And Mill again includes them in the class by saying in Book II: 'Because there are some propositions which are merely verbal, Hobbes, in order apparently that his definition might be rigorously universal, defined a proposition as if no propositions declared anything except the meaning of words.'³

The expression 'merely verbal proposition' would be an appropriate designation for propositions in which information is given merely about words. For the designation of other propositions we could hardly expect to find anything more suitable than the expression, which Mill himself sometimes uses, 'proposition which is not merely verbal'.⁴ For we could hardly expect all other propositions to have any positive character in common. But when we find, opposed to 'merely verbal proposition', the designation 'real proposition', we are prepared to find that what is called a 'merely verbal proposition' is something which would be more appropriately called a 'merely apparent proposition', just as Mill calls what he contrasts with 'real inference' not 'verbal' but 'apparent inference'. For we are prepared to find that what is called a 'merely verbal proposition' is something which is not a proposition at all, but which bears a resemblance to a proposition and is in consequence capable of being mistaken for a proposition.

What we do find, however, is that Mill hesitates between these two very different accounts of what a merely verbal proposition is, or rather that he without hesitation offers both accounts as if there were no substantial difference between them. In the account of an 'essential proposition' already

¹ p 101² pp 107, 116³ pp 201-2⁴ p. 116, cf p 122.

quoted Mill says that such a proposition 'either gives no information, or gives it respecting the name, not the thing'.¹ Between the alternatives here offered it would seem necessary to choose. But Mill does not think so. He thinks that to give information merely respecting the name is to give no information:

'In distinguishing, however, the different kinds of matters of fact asserted in propositions, we reserved one class of propositions, which do not relate to any matter of fact, in the proper sense of the term, at all, but to the meaning of names. Since names and their signification are entirely arbitrary, such propositions are not, strictly speaking, susceptible of truth or falsity, but only of conformity or disconformity to usage or convention, and all the proof they are capable of, is proof of usage, proof that the words have been employed by others in the acceptance in which the speaker or writer desires to use them.'²

But why is not the fact that a certain name has a certain meaning just as much a fact as anything can be? Mill's reasoning seems to be as follows: Names and their signification are entirely arbitrary. In other words, whether and what a name means depends on our choice. Therefore, whether a proposition declaring the meaning of a name is true or false depends on our choice. But truth or falsity dependent on our choice is not, strictly speaking, truth or falsity. The reply to such reasoning should begin by pointing out that whether and what a name means does not *depend on* but *is* our choice. The fact that a certain name has a certain meaning is the fact that a certain mind adopts a certain attitude toward a certain type of sense datum. Why is not such a fact just as much a fact as anything can be? And why is a proposition purporting to record such a fact 'not, strictly speaking, susceptible of truth or falsity'? Granted that such a proposition is susceptible 'only of conformity or disconformity to usage or convention', surely its conformity to usage or convention, to the fact, that is, which it purports to record, is, strictly speaking, its truth, and its disconformity would be its falsity. Granted that 'all the proof they are capable of, is proof of usage; proof that the

¹ p. 129

² pp. 122-3

words have been employed by others in the acceptation in which the speaker or writer desires to use them', in what way is such proof deficient? If, indeed, the speaker's claim is about what a word *does* mean, this has no direct connexion with what the speaker 'desires'. If, on the other hand, the speaker's claim is about what he *desires* to make a word mean, then he will not be asked to prove his claim, because his claim will rest on the introspection of evidence which is accessible to him but which neither is accessible nor is capable of being made accessible to others. Even so, he claims to record a fact, and though others cannot know that his claim is true and cannot know that his claim is false, they can very easily know that his claim is *either* true *or* false.

The same position is taken up at a fateful juncture, namely immediately before drawing the distinction between real and merely apparent inference:

'Assertion, in the first place, relates either to the meaning of words, or to some property of the things which words signify. Assertions respecting the meaning of words, among which definitions are the most important, hold a place, and an indispensable one, in philosophy; but as the meaning of words is essentially arbitrary, this class of assertions are not susceptible of truth or falsity, nor therefore of proof or disproof'¹

Yet we should expect a definition to be either true or false even where not susceptible of proof or disproof. In Chapter viii, 'Of Definition', Mill himself says: "The simplest and most correct notion of a Definition is, a proposition declaratory of the meaning of a word; namely, either the meaning which it bears in common acceptation, or that which the speaker or writer, for the particular purposes of his discourse, intends to annex to it."² It is of great importance to distinguish, as Mill does, these two types of definition. But, while a claim about the meaning which a word 'bears in common acceptation' may, and a claim about the meaning which 'the speaker or writer, for the particular purposes of his discourse, intends to annex' to a word may not, be susceptible of proof or disproof, both types of definition are equally *either* true *or* false. Nor

¹ p. 179.

² p. 151.

does Mill ever pretend that there is in this respect any difference between them. He holds that both types of definition are equally *neither* true *nor* false.

The ultimate explanation of Mill's occupation of this position that a definition, of whatever kind it be, is neither true nor false is to be found in his treatment of the 'essential proposition'. I have already quoted Mill's claim that the 'essential proposition', when once the verbal nature of the distinction between essence and accident has been grasped, 'either gives no information, or gives it respecting the name, not the thing'.¹ And we have already seen that, although the alternatives are plainly exclusive, Mill tries, on the somewhat flimsy pretext that 'names and their signification are entirely arbitrary',² to effect a reconciliation. But why is Mill anxious to achieve the impossible? What we have now to see is that both alternatives are not only intelligible but also capable of being so impressively presented that Mill may have found both of them irresistible.

We must begin by examining Mill's adoption of Locke's transformation of the distinction between essence and accident. The schoolmen

'said, truly, that *man* cannot be conceived without rationality. But though *man* cannot, a being may be conceived exactly like a man in all points except that one quality, and those others which are the conditions or consequences of it. All therefore which is really true in the assertion that man cannot be conceived without rationality, is only, that if he had not rationality, he would not be reputed a man. There is no impossibility in conceiving the *thing*, nor, for aught we know, in its existing: the impossibility is in the conventions of language, which will not allow the thing, even if it exist, to be called by the name which is reserved for rational beings. Rationality, in short, is involved in the meaning of the word *man*: is one of the attributes connoted by the name. The essence of man, simply means the whole of the attributes connoted by the word; and any one of those attributes taken singly, is an essential property of man.'³

The position here adopted is clear enough, in spite of the fact that the language in which it is formulated is accommodated

¹ p 129.

² p 122

³ p 124.

to the position here rejected. What Mill ought to say is this: What the schoolmen called 'the essence of man' is the set of attributes, and what they called 'an essential property of man' is an attribute belonging to the set, which is connoted by the name 'man'. He ought not, in adopting Locke's transformation of the distinction between essence and accident, to try to preserve the language in which the original distinction was formulated. For, whatever the words 'essence' and 'essential' may mean, the expressions 'the essence of man' and 'an essential property of man', being expressions in which the name 'man' is not *spoken about* but *occurs*, require the distinction between what is and what is not essential to be sought in the nature of man without reference to 'the conventions of language'.

This transformation of the distinction between essence and accident obviously prescribes a corresponding transformation of the distinction between essential and accidental propositions. For

'we may predicate of a name which connotes a variety of attributes, another name which connotes only one of these attributes, or some smaller number of them than all. In such cases, the universal affirmative proposition will be true; since whatever possesses the whole of any set of attributes, must possess any part of that same set. A proposition of this sort, however, conveys no information to any one who previously understood the whole meaning of the terms. The propositions, Every man is a corporeal being, Every man is a living creature, Every man is rational, convey no knowledge to any one who was already aware of the entire meaning of the word *man*, for the meaning of the word includes all this: and that every *man* has the attributes connoted by all these predicates, is already asserted when he is called a man. Now, of this nature are all the propositions which have been called essential. They are, in fact, identical propositions.'¹

There is no difficulty in seeing why, in the light of the transformation of the distinction between essence and accident, 'essential propositions' should be thought to be identities, tautologies, neither true nor false. There is difficulty rather in seeing why they should be thought to be propositions, why they should be thought to give information even about the

¹ pp 125-6.

meanings of words. What the transformation of the distinction between essence and accident directly prescribes is only that the predicate of a sentence, of the kind which the original distinction between essence and accident would require to be the vocal or graphic specification of an essential proposition, connotes nothing which its subject does not; that the connotation of its predicate is either identical with, or a selection from, the connotation of its subject. But what the status of a sentence answering to this description must be is a further question. If, for example, the original distinction between essence and accident requires that the sentence 'Every man is rational' is a specification of an essential proposition, then the transformation of the distinction between essence and accident requires that rationality either is connoted by, or belongs to a set of attributes connoted by, the name 'man'. Granted, however, that what the transformed distinction between essence and accident requires must be true, it is a further question what the status of the sentence 'Every man is rational' must be. The question may be answered differently by thinkers who are agreed that rationality belongs to a set of attributes connoted by the name 'man'.

That the sentence is tautological and not propositional may be argued thus. Suppose, for the sake of illustration, that the total connotation of the name 'man' is the conjunction of rationality and corporeity. Then the sentence 'Every man is rational' differs only vocally and graphically from, but agrees entirely in meaning with, the sentence 'Every being which is both rational and corporeal is rational'. Now it is plain that the latter sentence 'conveys no information' whether 'to any one who previously understood the whole meaning of the terms' or to anyone who did *not* previously understand the whole meaning of the terms. The *utterance* of the sentence might be said to convey information. The hearer might learn from the utterance that the speaker, although corporeal, was not rational. But our business is not with what the hearer might learn but with what he is told. And it is plain that the speaker 'asserts of a thing under a particular name, only what

is asserted of it in the fact of calling it by that name'¹ and that, by doing so, he gives no information whether respecting the name or respecting the thing. What the sentence vocally or graphically specifies is a tautology and not a proposition. The sentence is tautological and not propositional. All this, I say, is plain where we have to do not with the sentence 'Every man is rational' but with the sentence 'Every being which is both rational and corporeal is rational'. But, *ex hypothesi*, these two sentences differ only vocally and graphically, agreeing entirely in meaning. Now the identity of a proposition is unimpaired by merely vocal and graphic diversity. The expressions 'the proposition that every being which is both rational and corporeal is rational' and 'the proposition that every man is rational' must, therefore, agree in denotation. If either expression is non-denotative, both expressions are non-denotative. The sentence 'Every man is rational' must, then, be concluded to be tautological and not propositional.

But Mill says 'A proposition of this sort, however, conveys no information to any one who previously understood the whole meaning of the terms',² and he thereby unmistakably suggests that a proposition of this sort may convey information to someone who did *not* previously understand the whole meaning of the terms. The remark is at best misleading. Whether the sentences in question do or do not specify propositions and, if they do, what kind of propositions they specify, can have nothing to do with what the hearer does or does not previously understand. Let '*p*' be any indicative sentence. If you already know that *p*, then anyone who asserts that *p* might be said to convey no information to you, and, perhaps, the proposition, that *p*, might be said to convey no information to you. But it would be very misleading for a logician to say, if botanical propositions were in question, that propositions of this sort, 'however', convey no information to a botanist who has nothing to learn. What we want to know is whether the sentences in question are such that the speaker asserts nothing or such that the speaker asserts

¹ p 129² p 125

something about the meanings of words. If you say that the speaker asserts something about the meanings of words, it is irrelevant to add the proviso that no information is conveyed to anyone already acquainted with the fact asserted. And, because irrelevant, it is misleading. For, relevance being expected, it unmistakably suggests that the propositions do not merely have the property indicated but are *peculiar* in having it.

This brings us to the alternative view of the 'essential proposition', the view that it does give information, but 'gives it respecting the name, not the thing'. This alternative, like the irreconcilable alternative just examined, is not only intelligible but also capable of being impressively presented. It can be best studied by turning to Chapter viii, 'Of Definition', where the 'essential proposition' appears as one of two modes of defining, declaring the connotation of a connotative name.

'This might be done either directly or indirectly. The direct mode would be by a proposition in this form. "Man" (or whatsoever the word may be) "is a name connoting such and such attributes", or "is a name which, when predicated of anything, signifies the possession of such and such attributes by that thing". Or thus: Man is everything which possesses such and such attributes: Man is everything which possesses corporeity, organization, life, rationality, and certain peculiarities of external form.'

It should be observed that already, in illustrating the 'direct mode', Mill has passed from formulae in which the name 'man' does not *occur* but is *spoken about* to formulae in which the name 'man' is not *spoken about* but *occurs*. He has indeed inadvertently passed from formulae illustrating the 'direct mode' to formulae illustrating the 'indirect mode'. For he proceeds:

'This form of definition is the most precise and least equivocal of any, but it is not brief enough, and is besides too technical for common discourse. The more usual mode of declaring the connotation of a name, is to predicate of it another name or names of known signification, which connote the same aggregation of attributes. This may be done either by predicating of the name intended to be defined, another connotative name exactly synonymous, as, "Man is a human being".

which is not commonly accounted a definition at all; or by predicating two or more connotative names, which make up among them the whole connotation of the name to be defined. In this last case, again, we may either compose our definition of as many connotative names as there are attributes, each attribute being connoted by one, as, Man is a corporeal, organized, animated, rational being, shaped so and so; or we may employ names which connote several of the attributes at once, as, Man is a rational *animal*, shaped so and so.'

Surely it is the last of these alternatives that we employ if we say: 'Man is everything which possesses corporeity, organization, life, rationality, and certain peculiarities of external form.' Mill adds: 'The definition of a name, according to this view of it, is the sum total of all the *essential* propositions which can be framed with that name for their subject.'

Faced with this important passage, those who take the view that the 'essential proposition' gives no information, is neither true nor false, is a tautology and not a proposition, must make a very important concession, a concession which may easily seem to involve the surrender of their view of the 'essential proposition'. They must concede that Mill's 'indirect mode' of definition is a mode which is serviceably practised by people who are not careless speakers. The sentence 'Man is a corporeal, organized, animated, rational being, shaped so and so' can be *serviceably* used to subserve the intended communication which would be *correctly* subserved by using the sentence 'The name "man" connotes corporeity, organization, animation, rationality, such and such shape.'

It by no means follows, though it may easily seem to follow, that the former sentence can be *correctly* used to subserve either the intended communication which would be correctly subserved by using the latter sentence or any other intended communication. Similarly, from the admission that the sentence 'Boys will be boys' can be serviceably used to subserve the intended communication which would be correctly subserved by using the sentence 'Boys will be devils', it by no means follows that the former sentence can be correctly used to subserve either this or any other intended communication.

Indeed, the use of the sentence 'Boys will be boys', more particularly the use of the word 'boys' in the predicate of this sentence, owes its forcefulness, as does all metaphor, to its incorrectness, to the discrepancy between what the symbol means and the intended communication subserviently to which the symbol is selected. Just because the use of the sentence is incorrect its use elicits the full co-operation of the hearer. The hearer reflects: "The speaker obviously does not mean what he says, obviously does not intend to communicate anything which his sentence could be correctly used to subserve. For he says nothing, there is no intended communication which his sentence could be correctly used to subserve. What then does he mean? What does he intend to communicate?"

Of the motive for the selection of the 'indirect', rather than the 'direct', mode of definition a different account must be given. Mill says that the 'direct mode', while it is on the one hand 'the most precise and least equivocal of any', is on the other hand 'not brief enough, and is besides too technical for common discourse'. This remark deserves, but also needs, expansion.

The direct mode is a formula in which the definiendum does not *occur*. Yet identification of definiendum is indispensable. In the written formula the *shape*, in the spoken formula the *sound*, of the definiendum must occur. That the shape occurs as a mere shape, a writer may show by enclosing it in inverted commas. That the sound occurs as a mere sound, a speaker commands no equivalent device for showing. Nor is the distinction between occurrence of shape *as symbol* and *as mere shape* sufficiently appreciated to encourage a writer's expectation that his inverted commas will be understood.

There is, then, some justification for Mill's claim that the direct mode is 'too technical for common discourse'. But a further motive for preferring the indirect mode may be suspected. Its very imperfection as a mode of definition leaves open a line of retreat. Should the definiendum turn out not to connote what those who choose the direct mode irrevocably

assert that it does, those who have chosen the indirect mode can plausibly plead that they were not defining

What can be done with the alternative view that the 'indirect mode' of definition is not only a serviceable but also a correct device? This is the alternative which Mill adopts. In doing so he allows the 'indirect mode' to drag the 'direct mode' down to its own level. What we ought to do, however, if we adopt this alternative, is to raise the 'indirect mode' to the level of the 'direct mode'.

We may concede the possibility of a sentence, 'Man is rational' or 'Every man is rational', differing only vocally and graphically from, but agreeing entirely in meaning with, the plainly *propositional* sentence '“Man” connotes rationality', and so itself *propositional*. If we concede the possibility of such a *propositional* sentence, we must still insist upon the actuality of an homonymous sentence (that is, a sentence differing in meaning from, but agreeing vocally and graphically with, the sentence whose possibility is being conceded), 'Man is rational' or 'Every man is rational', differing only vocally and graphically from, but agreeing entirely in meaning with, the plainly *tautological* sentence 'Every being which is both rational and corporeal is rational', and so itself *tautological*. Between the *propositional* sentence 'Man is rational' and the *tautological* sentence 'Man is rational', between which there would thus be only a superficial resemblance but a profound difference, the constant preservation of the sharpest distinction is indispensable. Mill, however, while implicitly recognizing the *propositional* sentence by treating the 'indirect mode' as a correct mode of definition, altogether fails to distinguish the *propositional* sentence from its *tautologous* homonym. Consequently, Mill visits upon the *propositional* sentence the sins of its *tautologous* homonym. It is this that prevents him from raising the 'indirect mode' to the level of the 'direct mode'. To allow the 'indirect mode' to drag the 'direct mode' down to its own level is the only course left open to him.

If we take the step of according to a sentence, 'Man is

rational', the status of a correct mode of definition, we must be careful to accord to it the full privileges of that status. We must say that it is a synonym of the sentence "‘Man’ connotes rationality’ and that it is a mere homonym of the *tautologous* sentence ‘Man is rational’. We must say, accordingly, that the name ‘man’, which occurs in the *tautologous* sentence ‘Man is rational’, no more occurs in the *propositional* sentence ‘Man is rational’ than in its synonym "‘Man’ connotes rationality’. The word ‘man’ in the *propositional* sentence ‘Man is rational’ is a mere homonym of the word ‘man’ in the *tautologous* sentence ‘Man is rational’. Of the homonymous word ‘man’ in the *propositional* sentence a positive diagnosis would demand some ingenuity. It clearly could not, without extensive re-interpretation of the remainder of the sentence, be declared a synonym of "‘man’".¹ It is possible, however, for two sentences to be synonymous without consisting of synonymous elementary symbols. And we might take up the position that the entire *propositional* sentence ‘Man is rational’ is all that either requires or admits of definition and that its definition is already given in declaring it a synonym of the sentence "‘Man’ connotes rationality’.

Whatever be the true positive diagnosis of the word ‘man’ in the *propositional* sentence ‘Man is rational’, it clearly cannot be that of the word ‘man’ in the *tautologous* sentence ‘Man is rational’. For of the latter word ‘man’ the true positive diagnosis is *ex hypothesi* that it is a synonym of the phrase ‘being which is both rational and corporeal’. But to offer this as the positive diagnosis of the word ‘man’ in the *propositional* sentence ‘Man is rational’ would be to require the *propositional* sentence ‘Man is rational’ to be a synonym of a sentence ‘Being which is both rational and corporeal is rational’ or (to give the proposal every chance) ‘A being which is both rational and corporeal is rational’. Now even those who would go the length of claiming that ‘A being which is both rational and

¹ *Second order* inverted commas are used on the same principle as ordinary inverted commas but in different circumstances. In order to *speak about* man we use ‘man’. In order to speak about what we use in order to speak about man, in order, namely, to speak about ‘man’, we use "‘man’".

corporeal is rational' is a propositional sentence would hardly suggest that the use of the sentence is among the correct modes of partially defining the name 'man'.

Book I treats 'Of Names and Propositions'. Names are exhaustively divided into *connotative* and *non-connotative*. Propositions are exhaustively divided into *real* and *merely verbal*. Of *merely verbal* propositions Mill recognizes, but nowhere connects, two kinds. The *merely verbal* propositions examined in Chapter v, 'Of the Import of Propositions', are propositions whose terms are *non-connotative*. The *merely verbal* propositions examined in Chapter vi, 'Of Propositions Merely Verbal', are propositions the connotation of whose subjects exhausts the connotation of their predicates.

Mill's doctrine concerning propositions whose terms are *non-connotative* is one of two concessions to the Nominalism of Hobbes. 'What he gives as the meaning of propositions, is part of the meaning of all propositions, and the whole meaning of some.' Mill remarks 'that Hobbes, in common with the other Nominalists, bestowed little or no attention upon the *connotation* of words; and sought for their meaning exclusively in what they *denote*'. And Mill's intention is to concede whatever elements of Nominalism survive his division of names into *connotative* and *non-connotative*. But the position ascribed to Hobbes is that every name connotes *the being denoted by itself*. And Mill's concessions imply that *the being denoted by itself* is part of what is connoted by a *connotative* name and is the whole of what is connoted by a *non-connotative* name. Neither concession is consistent with the division of names into *connotative* and *non-connotative*. The only consistent position would be a bold denial that non-connotative names are qualified to occur as terms.

Upon the supposition that the name 'man' connotes the conjunction of rationality with corporeity, consider the claim that the proposition specified by the sentence 'Every man is rational' is *merely verbal*. Instead of at once asking of what kind the proposition is, first ask whether what is specified by

the sentence is a proposition. *Ex hypothesi* our sentence agrees entirely in meaning with the plainly tautological sentence 'Every being which is both rational and corporeal is rational'. Yet our sentence, unlike this plainly tautological sentence, can serviceably deputize for the plainly propositional sentence 'Rationality is at least part of what the name "man" connotes'. If our sentence can deputize not only *serviceably* but also *correctly* for this plainly propositional sentence, the answer to our question must be that the sentence 'Every man is rational' is ambiguous and that it specifies both a tautology and a proposition. Mill, however, failing to detect the ambiguity, identifies the proposition with the tautology. Hence his refusal to choose between the alternatives 'either gives no information, or gives it respecting the name, not the thing'. And hence his opposition of '*merely verbal*' to '*real*'.

In thus ranking tautologies as propositions Mill follows Locke. Adopting also Locke's doctrine of Nominal Essences, Mill follows Locke in viewing essential propositions as tautologies. But Locke, although he concedes that they are true, contrasts all tautological self-evident propositions as *trifling* with other self-evident propositions as *instructive*. Mill, on the other hand, although he thinks *merely verbal* propositions 'not, strictly speaking, susceptible of truth or falsity', thinks that none but *merely verbal* propositions are legitimately assertable without appeal to experience. It is because Mill, unlike Locke, is an epistemological empiricist that Mill, unlike Locke, exploits the diagnosis of the tautology as a kind of proposition. Deduction is *merely apparent inference*. It is *merely verbal* transformation. But *merely verbal* operations are not *trifling*.

CHAPTER VI

MERELY APPARENT INFERENCE

WHAT is the subject of Book II? The title is 'Of Reasoning'. Already in the Introduction Mill has told us how he intends to use this word:

'But the word Reasoning, again, like most other scientific terms in popular use, abounds in ambiguities. In one of its acceptations, it means syllogizing, or the mode of inference which may be called (with sufficient accuracy for the present purpose) concluding from generals to particulars. In another of its senses, to reason is simply to infer any assertion, from assertions already admitted. and in this sense induction is as much entitled to be called reasoning as the demonstrations of geometry. Writers on logic have generally preferred the former acceptation of the term the latter, and more extensive signification is that in which I mean to use it'¹

And at the beginning of Book II Mill seasonably renews this profession:

'To infer a proposition from a previous proposition or propositions, to give credence to it, or claim credence for it, as a conclusion from something else, is to *reason*, in the most extensive sense of the term. There is a narrower sense, in which the name reasoning is confined to the form of inference which is termed ratiocination, and of which the syllogism is the general type. The reasons for not conforming to this restricted use of the term were stated in an earlier stage of our inquiry, and additional motives will be suggested by the considerations on which we are now about to enter'²

Without this explicit guidance, the title of Book III, 'Of Induction', might easily incline us to suppose that Book II is devoted to one kind of inference and Book III to another kind, the word 'reasoning' being used in the title of Book II in the narrower sense. But Mill's expressed preference for the wider sense of the word compels the abandonment of this supposition. Instead, we must suppose that, while Book III is devoted to one kind of inference, Book II is devoted, not to another kind of inference, but to inference in general. And we easily

¹ p. 3.

² p. 180

enough conjecture possible motives for devoting a Book to one kind of inference without devoting a Book to another kind of inference. Mill might, for example, be satisfied with the usual treatment of ratiocination but dissatisfied with the usual treatment of induction.

But the subject of Book II is not so easily settled. In the Introduction Mill has claimed only that 'induction is *as much* entitled to be called reasoning as the demonstrations of geometry'. In Book II Mill goes further. 'All inference is from particulars to particulars.'¹

'In the above observations it has, I think, been shown, that, though there is always a process of reasoning or inference where a syllogism is used, the syllogism is not a correct analysis of that process of reasoning or inference, which is, on the contrary (when not a mere inference from testimony), an inference from particulars to particulars, authorized by a previous inference from particulars to generals, and substantially the same with it; of the nature, therefore, of Induction.'²

Induction thus turns out to be not just one kind, but the only kind, of inference. Accordingly, while 'additional motives will be suggested by the considerations on which we are now about to enter',³ they will be motives not for preferring a wider to a narrower use of the word 'reasoning' but for preferring one narrower use to another—motives for restricting the applicability of the word to induction.

The real subject of Book II is the distinction between *real* and *merely apparent* inference.

This distinction is introduced in Chapter i, 'Of Inference, or Reasoning, in General', and, since it is an application of the distinction between *real* and *merely verbal* propositions, Mill rightly begins by recapitulating his account in Book I of the latter distinction. Yet Mill altogether fails to point out the connexion between the two distinctions. Instead he leaves us with the impression that the relevance of the distinction between *real* and *merely verbal* propositions amounts only to this: Merely verbal propositions being 'not susceptible of truth or falsity, nor therefore of proof or disproof' and our concern

¹ p. 221

² p. 225

³ p. 180

being with proof and disproof, we must leave merely verbal propositions alone and confine our attention to real propositions. And Mill even troubles to protest that 'the trivial examples by which, in manuals of Logic, the rules of the syllogism are illustrated, are often of this ill-chosen kind; formal demonstrations of conclusions to which whoever understands the terms used in the statement of the data, has already, and consciously, assented',¹ his point being that such a proposition as, that all men are living creatures, is unfit to serve as the major premiss of a syllogism whether in *Barbara* or in *Camestres*.

Yet the true connexion between the two distinctions, though nowhere explicitly acknowledged, is to be gathered from what Mill says in § 2. Mill's thesis here is that immediate inferences are 'cases in which the inference is apparent, not real'.² And he defines 'merely apparent inference' as follows:

'This occurs when the proposition ostensibly inferred from another, appears on analysis to be merely a repetition of the same, or part of the same, assertion, which was contained in the first'³

'In all these cases there is not really any inference; there is in the conclusion no new truth, nothing but what was already asserted in the premises, and obvious to whoever apprehends them. The fact asserted in the conclusion is either the very same fact, or part of the fact, asserted in the original proposition.'⁴

Again, in conceding that these operations are nevertheless important, Mill still insists: 'though that cannot be called reasoning or inference which is a mere reassertion in different words of what had been asserted before'.⁵

'The fact asserted in the conclusion is either the very same fact', as where we obvert or simply convert, 'or part of the fact, asserted in the original proposition', as where we convert *per accidens* or derive a comparatively indeterminate, from a comparatively determinate, proposition (whether a subaltern from a superaltern, or a proposition predicating a genus from a proposition predicating a species).

The connexion between the two distinctions must be this:

¹ pp 181-2.

² p. 181.

³ p. 181.

⁴ p. 183.

⁵ p. 184.

'*p*, therefore *q*' is a merely apparent inference if and only if '*p* or *q*' is a merely verbal proposition.

Profiting by our appreciation of this connexion, let us apply to the study of Mill's merely apparent inferences what has already been said of his merely verbal propositions. Consider the simpler of the two types of merely apparent inference which Mill here distinguishes, that, namely, where 'the fact asserted in the conclusion' is not 'part of the fact' but is 'the very same fact' as is 'asserted in the original proposition'. Consider, in other words, the nature of '*p*, therefore *q*' where '*p*' and '*q*' are synonymous sentences, only vocally and graphically different.

Where these conditions are fulfilled we must begin by insisting upon the actuality of a sentence '*p* or *q*', only vocally and graphically different from the plainly tautological sentence '*p* or *p*' and from the plainly tautological sentence '*q* or *q*' (these plainly tautological sentences differing only vocally and graphically from one another), and therefore itself tautological. Of *this* sentence '*p* or *q*' there may be homonyms¹ of which a very different account must be given. In studying *this* sentence '*p* or *q*', what we need especially to watch is the danger of being misled by its vocal and graphic specification—a danger heightened by the fact that there either are, or at least are thought to be, homonymous sentences. And the remedy is obvious. Of *this* sentence '*p* or *q*' the true nature is most surely discerned by comparison with either the synonymous sentence '*p* or *p*' or the synonymous sentence '*q* or *q*'. For these are *plainly* what it is *surreptitiously*. Now even those who would go the length of claiming that the sentences '*p* or *p*' and '*q* or *q*' are propositional and not tautological would hardly suggest that they are among the correct modes of formulating the claim that either '*p*' is false or '*q*' is true. It seems clear, therefore, that Mill cannot intend '*p*, therefore *q*' to be only vocally and graphically different from '*p*, therefore *p*' and from '*q*, therefore *q*'. Here, he would surely say,

¹ Synonyms agree in meaning, but differ vocally or graphically. Homonyms agree vocally and graphically, but differ in meaning.

we have neither real, nor even apparent, inference. Yet, if 'p' and 'q' are only vocally and graphically different from one another, how can 'p, therefore q' be more than vocally and graphically different from 'p, therefore p' and from 'q, therefore q'?

But it might be contended that even *this* sentence ' \bar{p} or q' can be serviceably though not correctly substituted for the sentence 'Either " \bar{p} " is false or " \bar{q} " is true'. Further, it might be contended that there is an homonymous sentence ' \bar{p} or q' differing only vocally and graphically from the plainly propositional sentence 'Either " \bar{p} " is false or " \bar{q} " is true' and substitutable, accordingly, not only serviceably but also correctly. Let this be conceded. It must then be insisted that, just as the true nature of the *tautological* sentence ' \bar{p} or q' is most surely discerned by comparison with its plainly *tautological* synonyms, so is the true nature of the homonymous *propositional* sentence ' \bar{p} or q' most surely discerned by comparison with its plainly *propositional* synonyms.

Instead, then, of formulating a merely apparent inference: 'p, therefore q', let us try the formula: '"p" is true, therefore "q" is true.' But what then becomes of Mill's claim that 'there is not really any inference; there is in the conclusion no new truth, nothing but what was already asserted in the premises, and obvious to whoever apprehends them'? Instead of an insufficient, we now have an excessive, difference between premiss and conclusion. Our inference is no longer under suspicion of being merely apparent. Instead, it is under suspicion of being invalid. The suspicion might be dispelled by representing the expression '"p" is true, therefore "q" is true' as enthymematic, the premiss '"p" means all that "q" means' being suppressed. Whatever diagnosis be accepted, Mill's account of merely apparent inference will not be satisfied.

The incoherence of Mill's doctrine of the merely apparent inference is thus the outcome of the incoherence of Mill's doctrine of the merely verbal proposition. His doctrine of the merely verbal proposition is an attempt to reconcile incompatibles. The same vocal and graphic type may

be the specification of both a proposition and a tautology. We may say even that the same sentence may be both propositional and tautological. Whatever convention we adopt, we must not be deceived by mere identity of vocal and graphic specification. But the convention which makes identity of sentence require not only identity of vocal and graphic specification but identity also of meaning diminishes the likelihood of our mistaking mere identity of vocal and graphic specification for anything more. Let us, then, in accordance with this convention, say rather that different sentences may have the same vocal and graphic specification and that, in particular, a propositional sentence may be a homonym of a tautological sentence. Where this condition is fulfilled there is a danger of deception. But we may be so fortunate as to find that the propositional sentence has synonyms which have no tautological homonyms and that the tautological sentence has synonyms which have no propositional homonyms. Then the way to guard against deception is to judge the original propositional sentence and the original tautological sentence, each by its synonyms. What Mill has done is, on the other hand, to judge what is clear by appealing to what is confused. So he reaches his merely verbal proposition, at once verbal because giving information about words and not real because giving no information at all. Both of two mutually exclusive alternatives are thus chosen.

It is only a consequence of this that Mill treats the conclusion of a merely apparent inference as at once only verbally different and more than verbally different from the premiss.

'Thus, if we were to argue, No man is incapable of reason, for every man is rational, or, All men are mortal, for no man is exempt from death, it would be plain that we were not proving the proposition, but only appealing to another mode of wording it, which may or may not be more readily comprehensible by the hearer, or better adapted to suggest the real proof, but which contains in itself no shadow of proof'¹

We may grant Mill that one 'mode of wording' a proposition may be 'more readily comprehensible by the hearer' than another.

The hearer may happen to know the meaning of the one sentence and to be ignorant of the meaning of the other. But one 'mode of wording' a proposition cannot be 'better adapted to suggest the real proof' than another where the meanings of both modes are equally known. The modes of wording can indeed accomplish nothing except the communication of the meanings. Only the meanings can suggest a proof. But the meanings are *ex hypothesi* the same. Mill, however, is not in earnest with this hypothesis. And only because he is not in earnest with it does he insist that the modes of wording must be different. The fact asserted in the conclusion is plainly the very same fact as is asserted in the premiss where '*p*' is both premiss and conclusion. But Mill's merely apparent inference is not 'mere reassertion' but 'mere reassertion *in different words*'. His 'proposition ostensibly inferred from another, appears *on analysis* to be merely a repetition of the same, or part of the same, assertion, which was contained in the first', but only 'on analysis'. But this insistence on at least a verbal difference involves a more than verbal difference. '*p*, therefore *q*' can be preferred to '*p*, therefore *p*' only if the former is treated as a synonym of ' "*p*" is true, therefore "*q*" is true'. There is no middle course between idle repetition, aggravated by verbal subterfuge, and real inference either invalid or enthymematic.

The subject of Book II is the distinction between *real* and *merely apparent* inference. What is the connexion between this distinction and that between *real* and *merely verbal* (tautological) propositions? Mill fails to answer this question. In drawing the distinction between *real* and *merely verbal* propositions, he provides only for subject-predicate propositions. But the answer to our question requires a distinction between real and merely verbal *alternative* propositions: '*p*, therefore *q*' is a *merely apparent* inference if and only if '*p* or *q*' is a *merely verbal* proposition.

Mill's *merely verbal* (tautological) proposition was shown to be a confusion of incompatibles. If '*p* or *q*' differs only

verbally from ' \bar{p} or p ', it is tautological. If it differs only verbally from 'Either " p " is false or " q " is true', it is propositional. It may be ambiguous, specifying with the one meaning a tautology, specifying with the other meaning a proposition. But to specify both a tautology and a proposition is not to specify a tautological proposition. Equally, ' p , therefore q ' may be both a way of saying ' p , therefore p ' and a way of saying ' p is true, therefore " q " is true'. With the one meaning we have less, with the other meaning we have more, than *merely apparent* inference. Only by adding the meanings and dividing the sum by two could Mill's doctrine be satisfied.

Let us rather define 'merely apparent inference' as follows: ' p , therefore q ' is a merely apparent inference if and only if ' \bar{p} or q ' is tautological. Merely apparent inference, in other words, is merely verbal transformation. At least there is such an operation. What we may hope to ascertain by a study of Book II is whether *deduction* is such an operation and whether such an operation can usefully supplement *real* inference.

CHAPTER VII

THE PRINCIPLE OF SYLLOGISM

IN introducing the distinction between *real* and *merely apparent* inference, in Chapter i, Mill gives the impression that, while he defends the thesis that immediate inference is merely apparent inference, he takes it for granted that syllogism is real inference. For, after disposing of immediate inference, he says:

'Having noticed, in order to exclude from the province of Reasoning or Inference properly so called, the cases in which the progression from one truth to another is only apparent, the logical consequent being a mere repetition of the logical antecedent, we now pass to those which are cases of inference in the proper acceptation of the term, those in which we set out from known truths, to arrive at others really distinct from them'

And he at once proceeds to recognize a distinction between two kinds of 'Reasoning' or 'Inference' called 'Induction' and 'Ratiocination or Syllogism' respectively. He adds: 'It will presently be shown that there is a third species of reasoning, which falls under neither of these descriptions, and which, nevertheless, is not only valid, but is the foundation of both the others.'² But, while he tries, in what follows, to improve on 'the expressions, reasoning from particulars to generals, and reasoning from generals to particulars',³ he does not challenge the view that syllogism is real inference. And in his table of contents he gives as the topic of § 3 'Inferences proper, distinguished into inductions and ratiocinations'. Yet at the end of § 3 Mill clearly enough indicates that the question whether syllogism is real inference has still to be raised: 'Induction, then, is a real process of Reasoning or Inference. Whether, and in what sense, as much can be said of the Syllogism, remains to be determined by the examination into which we are about to enter.'⁴ And the explanation of Mill's procedure may be that he prefers only gradually to show his

¹ p. 185

⁴ p. 187.

² pp. 185-6.

³ p. 186.

hand, only gradually to disclose the full extent of his divergence from the orthodox tradition.

But upon the examination of the question whether syllogism is real inference Mill does not at once allow us to enter. He does so only in Chapter iii, 'Of the Functions and Logical Value of the Syllogism'. Meanwhile, in Chapter ii, 'Of Ratiocination, or Syllogism', Mill confirms the impression that syllogism is, according to him, real inference. It is in the footnote at the end of the chapter that Mill's most unmistakable acknowledgement of the view that syllogism is real inference is made:

'But though it may be proper to limit the term Deduction to the application of a general principle to a special case, it has never been held that Ratiocination or Syllogism is subject to the same limitation, and the adoption of it would exclude a great amount of valid and conclusive syllogistic reasoning. Moreover if the *dictum de omni* makes prominent the fact of the application of a general principle to a particular case, the axiom I propose makes prominent the condition which alone makes that application a real inference

'I conclude, therefore, that both forms have their value, and their place in Logic. The *dictum de omni* should be retained as the fundamental axiom of the logic of mere consistency, often called Formal Logic, nor have I ever quarrelled with the use of it in that character, nor proposed to banish it from treatises on Formal Logic. But the other is the proper axiom for the logic of the pursuit of truth by way of Deduction, and the recognition of it can alone show how it is possible that deductive reasoning can be a road to truth.'¹

Mill here urges against the *dictum de omni* and in support of his own formulae that the *dictum de omni* does not, and that his own formulae do, make prominent the condition which alone makes syllogism real inference. And this is an argument by which he can hope to profit only if he holds that at least some syllogisms are real inferences. If, on the other hand, syllogism is never real inference, the argument is favourable to the *dictum de omni* and unfavourable to Mill's formulae.

Before turning to Chapter iii, where alone the question whether syllogism is real inference is more than incidentally

¹ pp 207-8.

treated and where, as I shall try to show, Mill's answer is that syllogism, like immediate inference, is merely apparent, it is necessary to consider the contents of Chapter II. For, granted that the view that syllogism is real inference is in Chapter II only incidentally acknowledged, the fact that a logician, who takes the view that syllogism is merely apparent inference, yet allows himself, in a chapter entitled 'Of Ratiocination, or Syllogism', to deal only incidentally with the question whether syllogism is real inference is itself remarkable. The title of Chapter III, 'Of the Functions and Logical Value of the Syllogism', is appropriate enough to a treatment of the question whether syllogism is real inference. But the title of Chapter II justifies the expectation of an answer to the question what syllogism is, and an account of the 'functions and logical value' of the syllogism would seem to be at least an indispensable part of the answer to the question what syllogism is. We may wonder even what else there can be for Mill to talk about in Chapter II. For much that might be talked about Mill takes as read:

'The analysis of the Syllogism has been so accurately and fully performed in the common manuals of Logic, that in the present work, which is not designed as a manual, it is sufficient to recapitulate, *memoriae causâ*, the leading results of that analysis, as a foundation for the remarks to be afterwards made on the functions of the Syllogism, and the place which it holds in science'¹

And Mill concerns himself with the differences of figure and mood only in order to substantiate the claim that he is 'at liberty, in conformity with the general opinion of logicians, to consider the two elementary forms of the first figure as the universal types of all correct ratiocination'²

There is indeed no difficulty in seeing that what Mill does in Chapter II is to examine and reject the *dictum de omni* and to propose and defend alternative formulae. The difficulty of seeing what question Mill is trying to answer is only the difficulty of seeing what question the *dictum de omni* tries to answer. Further, it is easy enough to say that this question is:

¹ p. 188.

² p. 195.

What is the *principle* of syllogism? The difficulty is then to know what it is that we are saying.

In endorsing Mill's condemnation of the *dictum de omni* we must carefully distinguish between *variants* and *rivals* of the *dictum de omni*. The familiar formula, 'Quicquid de omni valet, valet etiam de quibusdam et de singulis. Quicquid de nullo valet, nec de quibusdam valet, nec de singulis',¹ and that quoted from Zabarella by Mr. Joseph, 'Quod de aliquo omni praedicatur, praedicatur etiam de qualibet eius parte',² are *variants* of the *dictum de omni*. And they are fairly represented by Mill's 'That whatever can be affirmed (or denied) of a class, may be affirmed (or denied) of everything included in the class.'³ But the formula given by Aldrich, 'Quod praedicatur Universaliter de alio, (i.e. de termino distributo,) sive affirmative, sive negative, praedicatur similiter de omnibus sub eo contentis',⁴ and that quoted from Crackenthorpe by Mr. Joseph, 'Quidquid affirmatur (s. negatur) universaliter de aliquo, idem affirmatur (s. negatur) etiam de omni de quo illud praedicatur',⁵ are, like the *Nota notae* and the formulae which Mill later proposes, not *variants* but *rivals* of the *dictum de omni*. Some, perhaps all, of these rivals may also merit condemnation. But the condemnation of the *dictum de omni*, while itself the condemnation of all variants, is itself the condemnation of no rivals.

Now Mill, though he begins by satisfactorily formulating the *dictum de omni*, at once proceeds, in the course of his attack, to identify the *dictum de omni* with formulae which ought to be distinguished from it. It is only because he loosely identifies 'a class' with 'an universal, a genus or species',⁶ that he thinks that 'the *dictum de omni* conveyed an important meaning' to philosophers who accepted secondary substances. The implication is that to condemn the *dictum de omni* is to reject secondary substances. From this implication I dissent.

But that the *dictum de omni* itself merits condemnation as a

¹ Welton, *Manual of Logic*, vol 1, p 285

² *Introduction to Logic*, 2nd ed., p 296

³ p 198

⁴ *Artis Logicae Rudimenta*, cap. III, § 6

⁵ Op. cit., p 296, note

⁶ p. 199.

sheer tautology ought to be clear the moment we recognize that by 'predicating of a class (*de omni*)' must be meant predicating of a class distributively, that is, predicating of the members severally, and not predicating of a class collectively. For what alone can conceal the tautological character of the *dictum de omni* is the fact that we can distinguish between a class and its members, as we can distinguish between any whole and its parts. A whole has properties which no part has, and conversely. The illustration of the claim requires no subtlety. Most obviously, a class contains so many members, but no member does; and each member is a member of the class, but the class is not—unless indeed the class character is negative—a member of itself. But to try to turn this genuine difference between a class and its members to account, in order to vindicate the *dictum de omni* against the charge of tautology, would lead only to the rejection of the *dictum de omni* as wildly false. 'John's personality perhaps has no unity, but he can hardly be called a collection of *men*.'¹

Already in Book I, Chapter v, Mill speaks of the view that predication 'consists in referring something to a class'² as 'the basis of the celebrated *dictum de omni et nullo*'³ And he claims: 'There is no real difference, except in language, between this theory of Predication and the theory of Hobbes'⁴ The claim must be upheld. Unfortunately, in his defence of the claim, Mill seems to beg the question by his definition of the word 'class':

'For a class is absolutely nothing but an indefinite number of individuals denoted by a general name. The name given to them in common, is what makes them a class. To refer anything to a class, therefore, is to look upon it as one of the things which are to be called by that common name. To exclude it from a class, is to say that the common name is not applicable to it.'⁵

Again,

'When, by studying not the meaning of words, but the phenomena of nature, we discover that these attributes are possessed by some object

¹ Bradley, *Principles of Logic*, Book II, Pt I, c II, § 3
² p 104

⁴ pp 103-4

² p 103

⁵ p 104

not previously known to possess them, (as when chemists found that the diamond was combustible), we include this new object in the class, but it did not already belong to the class. We place the individual in the class because the proposition is true, the proposition is not true because the object is placed in the class."¹

We must protest that there is at least *a* sense of the word 'class' in which classes are not made by being recognized and named, in which we do not *produce* but only *discover* classes. No doubt we speak of 'including an object in a class', 'placing an object in a class'. But this way of speaking must not be pressed. We also say that Berkeley deprived the physical world of independent existence. Yet, whatever our differences, we all agree that the physical world *either* existed independently both before and after Berkeley lived *or* existed independently neither before nor after Berkeley lived. To classify objects is no more to *make* classes of them than to magnify the Lord is to *make* Him great. What alone makes a class is the presence, whether detected or undetected, of the same character in each of a plurality of objects.

This correction, however, need not prevent us from upholding Mill's claim that the Class Theory of Predication is only a variant of Nominalism. There is indeed another way in which we may try to show that the Class Theory is, as Mill says, *a ὑστερον πρότερον*.² We may represent the Class Theory as proposing to analyse the having a character, C, into the having the relational character of being among the things which have the character, C. We may say that this is what *in effect* the Class Theory proposes. But a theory ought not to be identified with any absurdity which it may involve. What the Class Theory *avowedly* proposes is to analyse, for example, the being a three-sided figure into the being a member of the class of three-sided figures. But only the neglect of *connotation* and the exclusive attention to *denotation* can conceal the substantial identity of the two proposals. And, if connotation is to be disregarded, if the being a member of the class of three-sided figures is *not* the being among the things which

¹ pp 105-6

² p 104

are characterized by three-sided figurehood, what *is* it but the being among the things denoted by the name 'three-sided figure'? Mill's definition of the word 'class', which I have said seems to beg the question against the distinction of the Class Theory from Nominalism, seems then to be the only definition which the Class Theory can admit without avowing its own absurdity.

Holding that the Class Theory, thus identified with the Nominalist doctrine of the import of the proposition, is the root of that which in the *dictum de omni* is objectionable, Mill, in the hope of finding something to take the place of the *dictum de omni*, naturally turns to his own doctrine of the import of the proposition. Now Mill treats every proposition as analysable into subject, predicate, and copula, and, not scrupling to 'speak of adjectives as names', he treats not only the subject but also the predicate of every proposition as a name. We have seen that he conceives the import of propositions to vary according as their subjects and predicates are connotative or non-connotative names, that of the four types of proposition which this conception requires him to distinguish he ignores the type whose subject is connotative but whose predicate is non-connotative, that he considers the type both of whose terms are non-connotative to convey no real information, and that he treats the distinction between the two remaining types, namely, that whose subject is non-connotative but whose predicate is connotative and that both of whose terms are connotative, as coincident with the distinction between singular and general propositions (whether universal or particular). All this lies behind the claim with which he lays the basis of the first formulae by which he proposes to supersede the *dictum de omni*:

'Every proposition which conveys real information asserts a matter of fact, dependent on the laws of nature, and not on classification. It asserts that a given object does or does not possess a given attribute, or it asserts that two attributes, or sets of attributes, do or do not (constantly or occasionally) coexist'¹

We have seen, further, that Mill claims that he is 'at liberty, in conformity with the general opinion of logicians, to consider the two elementary forms of the first figure as the universal types of all correct ratiocination'¹ Now the special rules of the first figure are that the major premiss must be universal (and, therefore, general) and that the minor premiss must be affirmative. Accordingly, the subject of the major premiss, being a general name, is according to Mill necessarily connotative, but the subject of the minor premiss may be either connotative or non-connotative. Ignoring the particular minor premiss, but distinguishing the singular from the universal minor premiss, and distinguishing the affirmative from the negative major premiss, Mill begins by recognizing that he is confronted by four types of syllogism.

The formulae which he proceeds to offer, however, recognize the distinction only between the affirmative and the negative syllogism:

"The first, which is the principle of affirmative syllogisms, is, that things which coexist with the same thing, coexist with one another or (still more precisely) a thing which coexists with another thing, which other coexists with a third thing, also coexists with that third thing The second is the principle of negative syllogisms, and is to this effect. that a thing which coexists with another thing, with which other a third thing does not coexist, is not coexistent with that third thing"²

These formulae are obviously inadequate, as indeed Mill in the footnote at the end of the chapter acknowledges. The fact that the relation whose transitivity conditions the validity of syllogistic inference is not symmetrical puts a difficulty in the way of contriving a formula as concise as, for example, the formula that things which are equal to the same thing are equal to one another. And the attempt to contrive a formula 'strikingly resembling the axioms of mathematics'³ easily ends in false simplification. 'That things which coexist with the same thing, coexist with one another' is plainly a false simplification. Two characters may be even invariably accompanied by a third and yet never accompanied by one another. The

¹ p. 195

² pp. 203-4.

³ p. 203.

attributes peculiar to animals and the attributes peculiar to plants are invariably accompanied by the attributes common to living beings. Mill's first suggestion, then, must be abandoned, as his 'still more precisely' grudgingly admits.

The more precise formulation of the principle of affirmative syllogisms and the formulation, modelled on this, of the principle of negative syllogisms are, in the first place, in need of elucidation. What is called 'a third thing' is the character connoted by the major term, the major premiss getting recognition in the formulae only after the minor premiss. If we permit ourselves the luxury of variables, we may elucidate the two formulae as follows. The principle of affirmative syllogisms is: If S coexists with M and M coexists with P, then S coexists with P. The principle of negative syllogisms is: If S coexists with M and P does not coexist with M, then S does not coexist with P.

And, in the second place, when the two formulae are thus elucidated, it is easily seen that they also are inadequate. Replying to Bain, Mill admits that 'when B is said to coexist with A, . . . it is possible, in the absence of warning, to suppose the meaning to be that the two things are only found together',¹ and he of course disclaims this interpretation. But it is vital to make clear that, while, in the affirmative syllogism, P need not be found only with M, yet M must be found only with P, and that, in the negative syllogism, M and P must never be found together. Mill's formulae fail to insist upon the universality of the major premiss.

To these coexistence formulae Mill himself prefers the alternatives offered at the end of the chapter. For these alternatives Mill has already, in Book I, Chapter vi, § 5, prepared the way:

'According to the formula which we have hitherto employed, and which is best adapted to express the import of the proposition as a portion of our theoretical knowledge, All men are mortal, means that the attributes of man are always accompanied by the attribute mortality'. . . But when the proposition is considered as a memorandum for practical

¹ p. 207, note

use, we shall find a different mode of expressing the same meaning better adapted to indicate the office which the proposition performs. The practical use of a proposition is, to apprise or remind us what we have to expect, in any individual case which comes within the assertion contained in the proposition. In reference to this purpose, the proposition, All men are mortal, means that the attributes of man are *evidence of*, are a *mark of*, mortality, an indication by which the presence of that attribute is made manifest.¹

It is this distinction that Mill now turns to account in Book II, Chapter II, §4. And it is because he holds, as we shall find in Chapter III, that to syllogize is to interpret a memorandum, that he is so pleased with the alternatives to the coexistence formulae:

'We shall find, as we proceed, the great convenience of the phraseology into which we have last thrown them, and which is better adapted than any I am acquainted with, to express with precision and force what is aimed at, and actually accomplished, in every case of the ascertainment of a truth by ratiocination.'²

Mill devises one formula to cover syllogisms both affirmative and negative whose minor premiss is a *singular* proposition, and one formula to cover syllogisms both affirmative and negative whose minor premiss is a *universal* proposition. As before, the minor premiss is taken before the major: 'whatever (S) has any mark (M), has that (P) which it (M) is a mark of'; 'Whatever (S) is a mark of any mark (M), is a mark of that (P) which this last (M) is a mark of'.³ More simply, (1) if M is a mark of P and S has M, then S has P; (2) if M is a mark of P and S is a mark of M, then S is a mark of P.

In the footnote at the end of the chapter⁴ Mill very wrongly identifies these formulae with the *Nota notae*. Now the *Nota notae* must be interpreted: *Nota (P) notae (M) est nota rei ipsius (S)*. But, as Mr. Joseph says,⁵ Mill 'understands by *res ipsa* the major term, and by *nota* the minor; so that the whole, instead of meaning that what qualifies an attribute qualifies the subject of it, comes to mean that what indicates the presence of

¹ pp 130-1

⁴ p 207

² p 207

⁵ *An Introduction to Logic*, 2nd ed, p 308, n 2

³ p 206 Variables mine

an attribute indicates what the latter indicates'. This difference between the *Nota notae* and Mill's formulae is determined by the difference in the way in which the universality of the major premiss has to be shown according as '*nota*' means, as in the *Nota notae*, 'attribute' or, as in Mill's formulae, 'evidence'. To say without qualification that P is an attribute of M is to claim that every M has the attribute P. The same claim would be made, not by saying that P is evidence of M, but by saying that M is evidence of P.

While Mr. Joseph rightly attacks Mill's identification of his formulae with the *Nota notae*, he also hunts that Mill's formulae are inferior to the *Nota notae*: 'He naturally gets into great difficulties where the minor term is singular.'¹ And Mr. Joseph goes on to characterize Mill's recourse to a separate formula as 'a rather desperate shift'. Yet the distinction between the two types of minor premiss is surely important. And it might be replied that the *Nota notae* would also get into great difficulties if it attended to the distinction. For its '*res ipsa*' is appropriate *only* where the minor premiss is singular.

More important than any estimate of the comparative merits and demerits of Mill's formulae and of the *Nota notae* and of other rivals of the *dictum de omni* is an understanding of the question to which all these are offered as answers, the question: What is the *principle* of syllogism? The nature of this question Mr. Joseph, by his insistence² on the difference between a *principle*, and a premiss, of inference, has illuminated. He rightly identifies (where it is of course presupposed that syllogism is inference) the question 'What is a syllogism?' with the question: What is the principle of inference which a syllogism exemplifies? And he rightly claims that to logic 'belongs the question, what is the principle of a certain inference which we make, and recognize to be valid?' To find and formulate that principle—to extricate it from its concrete setting in the matter of a particular argument, and set it out in abstract,—this is the logician's task.³ But is not this what

¹ p 308, n 2² pp 312-14³ p 313

the logician already in a thoroughly satisfying manner does when he offers what Mill calls 'exemplars, or blank forms for making syllogisms'?¹ The schemata of the moods already give what is required.

Suppose that 'Things equal to the same thing are equal to one another' is a satisfactory formulation of the principle of such inferences as 'Each of these rods is equal in length to that rod, therefore these rods are equal to one another'. With this formula compare 'If A, B, C . . are, each of them, equal to X, they are equal to one another, whatever A, B, C . . . X may be'. Surely this is just as good. There is no good reason for avoiding variables. Similarly, $(a+b)(a-b)=a^2-b^2$ is in no way inferior, but this time in one way superior, to 'The product of the sum and the difference of any two numbers is equal to the difference between the squares of the two numbers'. Similarly, the principle of syllogisms in *Barbara* is thoroughly satisfactorily formulated: 'The conjunction of the proposition that every M is P and the proposition that every S is M implies the proposition that every S is P'. Partly because we have here to reckon with three terms, partly because the relation whose transitivity governs the inference is not symmetrical, the use of variables is here an indispensable condition of a formula at once clear and concise. Nor may it be objected that this, granted that it is a satisfactory formulation of the principle of syllogisms in *Barbara*, is not a formulation of the principle of syllogisms in general. For the *dictum de omni* and its rivals are themselves devised to cover only the first figure, and they succeed in covering the different moods of the first figure only by the overt or covert specification of alternatives. It is equally legitimate to conjoin the schemata of the different moods.

¹ p. 189.

CHAPTER VIII

REPLY TO THE CHARGE OF *PETITIO PRINCIPII*

THE true interpretation of Chapter iii, 'Of the Functions and Logical Value of the Syllogism', requires the formulation and the rejection of two misinterpretations. Mr. W. E. Johnson, in finding 'all logicians who have referred to Mill's theory' guilty of one of these misinterpretations, is himself guilty of the other:

'In the first section of his chapter, Mill refers to two opposed classes of philosophers—the one of whom regarded syllogism as the universal type of all logical reasoning, the other of whom regarded syllogism as useless on the ground that all such forms of inference involve *petitio principii*. He then proceeds "I believe both opinions to be fundamentally erroneous," and this would seem to imply that he proposed to relieve the syllogism from the charge I believe, however, that all logicians who have referred to Mill's theory—a group which includes almost everyone who has written on the subject since his time—have assumed that the purport of the chapter was to *maintain* the charge of *petitio principii*, an interpretation which his opening reference to previous logicians would certainly not seem to bear "'

Johnson is right in saying that Mill 'proposed to relieve the syllogism from the charge'. But Johnson is wrong in saying that 'all logicians who have referred to Mill's theory . . . have assumed that the purport of the chapter was to *maintain* the charge'.² And Johnson's ascription of this misinterpretation to the logicians in question is conditioned by his own misinterpretation of the chapter. A mistake about the *way* in which Mill 'proposed to relieve the syllogism from the charge'

¹ *Logic*, Pt II, pp xvii-xviii

² Johnson must have forgotten Mansel's description of Mill as 'an able defender of the Syllogism' (Aldrich *Artis Logicae Rudimenta*, 4th ed., p. 203) and Mr. Joseph's remark that 'Mill's own way of avoiding the charge is not very successful' (*An Introduction to Logic*, 2nd ed., p. 302, n. 1). Mill *does* maintain the charge against 'every syllogism considered as an argument to prove the conclusion'. Venn, Welton, and Dr J. N. Keynes are not always careful to express this qualification and to avoid saying simply that Mill maintains the charge against syllogism.

leads Johnson to view the obvious way of meeting the charge as the only alternative to maintaining the charge.¹

Accused of arguing unsoundly, a man may try to show that he was arguing soundly. But to admit that he was not arguing soundly would not be to admit that he was arguing unsoundly. He may reply that he was not arguing at all. Now to bring the charge of *petitio principii* against the syllogism is to assert that the syllogism is unsound inference of a certain kind. And there are two ways in which a logician may try 'to relieve the syllogism from the charge'. The orthodox reply—the reply, for example, of Whately, Mansel, Venn, Keynes, and Joseph—is that at least some syllogisms are sound inferences, and, in particular, that their premisses can without *petitio principii* be used to prove their conclusions. The alternative reply, that syllogism is a legitimate and useful operation, but not a kind of inference, and so not a kind of unsound inference, is the reply of Mill. This reply is consistent with, and is conditioned by, his admission that of no syllogism can the premiss be used without *petitio principii* to prove its conclusion. Many logicians have thought Mill's reply so unpromising that they have treated Mill as an exponent of only that part of his position which he shares with those who maintain the charge. It is, therefore, important to recognize, as Johnson does, that Mill does not maintain the charge. It is not less important to recognize that Mill agrees, on a major issue, with those who do maintain the charge: 'It must be granted that in every syllogism, considered as an argument to prove the conclusion, there is a *petitio principii*'²

Johnson does not over-estimate the importance of the passage to which he refers us. But he misses its drift. Even considered in isolation, the passage will bear no interpretation but one which Johnson ignores, and it contains not a word which

¹ Johnson's mistake is pointed out by Professor Stebbing, who rightly urges that 'Mill saves the validity of the syllogism only by making the inference non-syllogistic' (*A Modern Introduction to Logic*, p. 220). Her remark, on the previous page, that Mill 'regarded the syllogism as a useful and valid mode of inference' is an unfortunate oversight.

² p. 210

requires the interpretation which Johnson puts upon it. Mill says:

'It is universally allowed that a syllogism is vicious if there be anything more in the conclusion than was assumed in the premises. But this is, in fact, to say, that nothing ever was, or can be, proved by syllogism, which was not known, or assumed to be known, before. Is ratiocination, then, not a process of inference? And is the syllogism, to which the word reasoning has so often been represented to be exclusively appropriate, not really entitled to be called reasoning at all? This seems an inevitable consequence of the doctrine, admitted by all writers on the subject, that a syllogism can prove no more than is involved in the premises. Yet the acknowledgment so explicitly made, has not prevented one set of writers from continuing to represent the syllogism as the correct analysis of what the mind actually performs in discovering and proving the larger half of the truths, whether of science or of daily life, which we believe, while those who have avoided this inconsistency, and followed out the general theorem respecting the logical value of the syllogism to its legitimate corollary, have been led to impute uselessness and frivolity to the syllogistic theory itself, on the ground of the *petitio principii* which they allege to be inherent in every syllogism. As I believe both these opinions to be fundamentally erroneous, I must request the attention of the reader to certain considerations, without which any just appreciation of the true character of the syllogism, and the functions it performs in philosophy, appears to me impossible, but which seem to have been either overlooked, or insufficiently adverted to, both by the defenders of the syllogistic theory and by its assailants.'¹

By pronouncing both of the two views here distinguished 'fundamentally erroneous' Mill clearly shows that his own view, if he has one, is some third view not here formulated. He disagrees not only, as Johnson sees, with the 'assailants' but also, as Johnson does not see, with the 'defenders of the syllogistic theory'. He disagrees with those who 'represent the syllogism as the correct analysis of what the mind actually performs in discovering and proving the larger half of the truths, whether of science or of daily life, which we believe' as well as with those who 'have been led to impute uselessness and frivolity to the syllogistic theory itself, on the ground of the *petitio principii* which they allege to be inherent in every

¹ pp. 209-10.

sylogism'. How does Johnson miss Mill's quarrel with the 'defenders of the syllogistic theory'? Johnson describes them as those who 'regarded syllogism as the universal type of all logical reasoning'.¹ Perhaps, then, Johnson supposes Mill to consider the defenders in error, not in viewing syllogism as a type of valid reasoning, but only in failing to recognize other types of valid reasoning. And it is a fact, and a fact of which Mill is acutely aware, that most logicians who have viewed syllogism as a type of valid reasoning have failed to recognize other types. Moreover, Mill does here incidentally ascribe to the 'defenders of the syllogistic theory' this failure to recognize other types of valid reasoning. They 'represent the syllogism as the correct analysis of what the mind actually performs in discovering and proving the larger half of the truths, whether of science or of daily life, which we believe', where 'the larger half' is 'that portion of our knowledge (much the greatest portion) which is not intuitive'.² But the context clearly requires their 'inconsistency' to lie in holding syllogistic proof to be at all possible:

'Is ratiocination, then, not a process of inference? And is the syllogism, to which the word reasoning has so often been represented to be exclusively appropriate, not really entitled to be called reasoning at all? This seems an inevitable consequence of the doctrine, admitted by all writers on the subject, that a syllogism can prove no more than is involved in the premises.'

Mill says 'seems'. But that this 'seems' is tantamount to 'in my opinion is' may be shown by comparing 'But this is, in fact, to say, that nothing ever was, or can be, proved by syllogism, which was not known, or assumed to be known, before.'

Johnson makes a singular request: 'I would only ask readers to disregard from the outset any passage in his chapter in which he appears to be contending for the annihilation of the syllogism as expressive of any actual mode of inference.'³ No doubt, if only we can manage, in reading Chapter iii,

¹ p. xvii.² p. 18.³ p. xviii.

to disregard what Mill *says*, we may well succeed in disregarding what Mill *thinks*. But my protest is two-edged. There are also passages in which Mill appears to claim that syllogism is real inference. And I am of course not at liberty to ask that readers disregard these. To such of these passages as occur in Chapter iii itself I shall try in what follows to do justice. But of such of these passages as occur outside Chapter iii the most formidable, namely, those occurring in Chapter i and Chapter ii, have already been examined. Of Mill's attitude in Chapter i toward the question I have offered the possible explanation that he elects to reserve his answer until he is ready to defend it. Of Mill's attitude in Chapter ii toward the question I can find no possible explanation except the forgetfulness conditioned by preoccupation with a different question. The forgetfulness imputed by this explanation would be wonderful. One could hardly find a view which Mill could with greater difficulty forget. But I cannot forbear the remark that the consideration that it is Mill to whom the forgetfulness would be imputed saves at least the possibility of this explanation.¹

In what follows, however, I propose to put these passages out of court by restricting my thesis to this: Whatever Mill may say elsewhere, in Chapter iii itself, where alone he is more than incidentally occupied with the question, what he says affords overwhelming evidence for the ascription to him of the view, that syllogism is not (real) inference and that only by conceding that syllogism is not inference can the charge of *petitio principii* be met.

Of the incidental treatment of the question in Chapter ii I admit Johnson's interpretation to hold. But it is on what Mill says in Chapter iii, and not on incidental remarks else-

¹ It is only the *survival*, not the *origin*, of the inconsistent passage in Chapter ii that presents difficulty. The *origin* of the passage is easily explained by considering that Mill had at one time accepted Whately's doctrine. In his *Autobiography* he remarks (pp. 180-1) "The explanations offered by Whately and others, though they might give a temporary satisfaction, always, in my mind, left a mist still hanging over the subject." But, to recognize how genuine Mill's 'temporary satisfaction' was, we must turn to his article on Whately's *Elements of Logic* (*Westminster Review*, 1828).

where, that Johnson rests his case. Let us now see, more specifically, what view it is that Johnson ascribes to Mill:

'Briefly his position may be thus epitomised. Taking a typical syllogism with the familiar major "All men are mortal", he substituted for "Socrates" or "Plato" the minor term "the Duke of Wellington" who was then living. He then maintained that, going behind the syllogism, certain instancial evidence is required for establishing the major, and furthermore that the validity of the conclusion that the Duke of Wellington would die depends ultimately on this instancial evidence. The interpolation of the universal major "All men will die" has undoubted value, to which Mill on the whole did justice, but he pointed out that the formulation of this universal adds nothing to the positive or factual data upon which the conclusion depends. It follows from his exposition that a syllogism whose major is admittedly established by induction from instances can be relieved from the reproach of begging the question or circularity if, and only if, the minor term is not included in the ultimate evidential data. The Duke of Wellington being still living could not have formed part of the evidence upon which the universal major depended. It was therefore part of Mill's logical standpoint to maintain that there were principles of induction by which, from a limited number of instances, a universal going beyond these could be logically justified. This contention may be said to confer constitutive validity upon the inductive process. It is directly associated with the further consideration that an instance, not previously examined, may be adduced to serve as minor premiss for a syllogism, and that such an instance will always preclude circularity in the formal process. Now the charge of circularity or *petitio principii* is epistemic, and the whole of Mill's argument may therefore be summed up in the statement that the epistemic validity of syllogism and the constitutive validity of induction, both of which had been disputed by earlier logicians, stand or fall together.'

If we turn to § 2 of Chapter iii we shall find, besides passages which forbid, passages which apparently but only apparently require, this interpretation. Mill begins by saying 'It must be granted that in every syllogism, considered as an argument to prove the conclusion, there is a *petitio principii*.'² Unless 'every' is a sheer oversight, this sentence is decisive. Again, 'That, in short, no reasoning from generals to particulars can, as such, prove anything: since from a general principle

¹ pp xviii-xix

² p 210

we cannot infer any particulars, but those which the principle itself assumes as known. This doctrine appears to me irrefragable.' Yet it is undeniable that Mill contrasts in *some* respect the Wellington syllogism with the Socrates syllogism. Concerning the Socrates syllogism he says that 'it is unanswerably urged by the adversaries of the syllogistic theory, that the proposition, Socrates is mortal, is presupposed in the more general assumption, All men are mortal: that we cannot be assured of the mortality of all men, unless we are already certain of the mortality of every individual man.' Concerning the Wellington syllogism he asks, 'Is it not matter of daily experience that truths previously unthought of, facts which have not been, and cannot be, directly observed, are arrived at by way of general reasoning?'¹ But of the opinion contrary to that which 'appears to me irrefragable' Mill says, not that it does rest or appears to him 'to rest on arguments equally indisputable',² but only that to logicians who 'though unable to dispute it, have usually exhibited a strong disposition to explain it away... the contrary opinion seemed to rest on arguments equally indisputable'. Mill does not himself think that it rests on indisputable arguments. He does think it worth refuting. And, allowing that the proposition, that the Duke of Wellington is mortal, may be a new truth reached by reasoning, his refutation of the opinion that syllogism is therefore sometimes real inference free from *petitio principii* is an attempt to show that the reasoning by which such a truth is reached is not syllogism. The opening of § 3 is decisive: 'From this difficulty there appears to be but one issue. The proposition that the Duke of Wellington is mortal, is evidently an inference; it is got at as a conclusion from something else; but do we, in reality, conclude it from the proposition, All men are mortal? I answer, no.'³ Accordingly, while 'if we were asked how, this being the case, we know the duke to be mortal, we should probably answer, Because all men are so',⁴ Mill holds that in so answering we should be wrong. Yet Mill says: 'Here, therefore, we arrive at the knowledge of a

¹ p 211.² Ibid.³ p 212.⁴ p 211.

truth not (as yet) susceptible of observation, by a reasoning which admits of being exhibited in the following syllogism '1 The explanation of this passage, *prima facie* very favourable to Johnson's interpretation, must be deferred. Mill does indeed hold that real inference may *be syllogistically formulated*. But we shall see that between this and the view that real inference may *be syllogism* Mill at least thinks that there is an important difference.

CHAPTER IX

FIRST ACCOUNT OF SYLLOGISM

THE account of the nature of the syllogism which Mill gives in §§ 2-4 is dominated by his remarkable loyalty to the usual definition of the universal proposition. This loyalty appears clearly in his statement that 'a general truth is but an aggregate of particular [that is, singular] truths'.¹ If this statement is true, if, in other words, a universal proposition is but a conjunction of singular propositions, then the assertion of the major premiss of a first figure syllogism must be the assertion among other things of the conclusion, and this form of the doctrine 'that in every syllogism, considered as an argument to prove the conclusion, there is a *petitio principii*'² is, as Mill claims, unanswerable. But alongside the account of the major premiss which this view of the universal proposition requires, there appears a different account which the facts seem to Mill to require.

That in formulating the major premiss we 'record all that we have observed, together with all that we infer from our observations', I shall call 'the loyal account of the major premiss'.³ That the 'results of many observations and inferences, and instructions for making innumerable inferences in unforeseen cases, are compressed into one short sentence', I

¹ p 213.

² p 210

³ Professor Stebbing says 'It is impossible to reconcile Mill's contention that the general proposition is a mere convenient abbreviation, with his view that the generalization involves inference' (*A Modern Introduction to Logic*, p 221, n 1) But the difficulty is only terminological. Mill holds (1) that the general proposition is an abbreviated conjunctive proposition, (2) that, of the conjuncts (of such general propositions as he is considering), some are known by observation and others are known by inference. The abbreviation and the inference are distinct, and even separable, operations. So far there is no difficulty. But it follows from (1) that the 'general' proposition is misleadingly designated. For the unabbreviated conjunctive proposition is not less general. Now the restriction of the word 'general' to the proposition which is both *general* and *abbreviated* is not less awkward than would be the restriction of the word 'generalization' to the operation which includes both *generalization* and *abbreviation*. And, although Mill does not habitually thus restrict the word 'generalization', he *does* momentarily thus restrict it by saying 'Generalization is not a process of mere naming, it is also a process of inference'.

shall call 'the disloyal account of the major premiss'. Mill's vain attempt to reconcile the two will engage us presently. But let us first satisfy ourselves that the omission, from the loyal account, of any reference to 'instructions for making innumerable inferences in unforeseen cases' is at any rate not a *mere* oversight.

When, therefore, we conclude from the death of John and Thomas, and every other person we ever heard of in whose case the experiment had been fairly tried, that the Duke of Wellington is mortal like the rest; we may, indeed, pass through the generalization, All men are mortal, as an intermediate stage, but it is not in the latter half of the process, the descent from all men to the Duke of Wellington, that the *inference* resides. The inference is finished when we have asserted that all men are mortal. What remains to be performed afterwards is merely deciphering our own notes.¹

Now, if 'it is not in the latter half of the process, the descent from all men to the Duke of Wellington, that the *inference* resides', if 'the inference is finished when we have asserted that all men are mortal', if 'what remains to be performed afterwards is merely deciphering our own notes', how can our notes comprise, besides the 'results of many observations and inferences', also 'instructions for making innumerable inferences in unforeseen cases'? Or are we, upon deciphering our notes, while understanding, yet not to execute, the instructions?

Still less is the insertion in the disloyal account of a reference to 'instructions for making innumerable inferences in unforeseen cases' a mere oversight. What is it in the facts that seems to Mill to require this addition?

Let us distinguish, as, where the major premiss is supposed known 'from observation', we may, three groups of objects which, being M, must be P if the major premiss, that every M is P, is to be true: (1) objects observed both to be M and to be P—Mill's 'John and Thomas, and every other person we ever heard of in whose case the experiment had been fairly tried'; (2) objects observed to be M but not observed to be P—the Duke of Wellington for Mill though not for us.

¹ pp. 213-14.

For us the Duke of Wellington is one in whose case the experiment has been fairly tried; (3) objects neither observed to be M nor observed to be P, including objects not observed at all—Mr. Lloyd George for Mill though not for us. For us Mr. Lloyd George illustrates what for Mill the Duke of Wellington illustrates. *We* cannot illustrate group (3) for *us*. The very differentia of the group is that the thinker relatively to whom it is such a group is unable to enumerate its members.

Of the three groups, (2) and (3) are comparable in an important respect in which both differ from (1). So far as group (1) is concerned, the claim that every M is P relies on mere observation. So far as groups (2) and (3) are concerned, the claim relies on inference. To these considerations both Mill's loyal account and his disloyal account do justice. But we may also compare groups (1) and (2) in an important respect in which both differ from group (3). The members of groups (1) and (2) can be enumerated. Accordingly, so far as these two groups are concerned, the claim that every M is P could be formulated by enumerating the objects and asserting of each that it is P. It would be necessary to add, so far as group (1) is concerned, that no object has been observed both to be M and not to be P and, so far as group (2) is concerned, that no other object has been observed to be M.

Now the reference of Mill's disloyal account to 'instructions for making innumerable inferences in unforeseen cases' is a perfectly intelligible attempt to do justice to group (3). But it is intelligible only if it is disloyal. Just because no member of group (3) is known to be M, no member of group (3) can be inferred to be P. Yet we obviously can do more than record our observations concerning every member of group (1) and our inferences concerning every member of group (2). We can equip ourselves for making inferences about whatever objects pass from group (3) to group (2) without needing on each occasion to consult the instantial evidence. We can record our conviction that every M is P. And, as long as we are confident about the reliability of our notes and are accordingly ready to treat the propositions there recorded as

premisses, we can, upon coming to know concerning a new object that it is M, *sylogistically infer* that it is P.

How does Mill try to reconcile the disloyal, with the loyal, account of the major premiss? The answer to this question must be sought in § 4: 'General propositions are merely registers of such inferences already made, and short formulae for making more: The major premise of a syllogism, consequently, is a formula of this description.'¹ But Mill proceeds: 'and the conclusion is not an inference drawn *from* the formula, but an inference drawn *according* to the formula the real logical antecedent, or premise, being the particular facts from which the general proposition was collected by induction Those facts, and the individual instances which supplied them, may have been forgotten. but a record remains, not indeed descriptive of the facts themselves, but showing how those cases may be distinguished, respecting which, the facts, when known, were considered to warrant a given inference According to the indications of this record we draw our conclusion, which is, to all intents and purposes, a conclusion from the forgotten facts '

Now a belief may easily be the *result* of a forgotten belief. But can anything except a forgotten conclusion be a *conclusion* from forgotten facts? Mill does not indeed say that the conclusion of the syllogism *is*, but only that it *to all intents and purposes is*, a conclusion from the forgotten facts And things are frequently said *to be to all intents and purposes* what nobody thinks that they *are*. But, if the conclusion of the syllogism *is not* a conclusion from the forgotten facts, from what *is* it a conclusion? Is it a conclusion from the formula, namely, the major premiss, and is it only to all intents and purposes an inference drawn not from, but according to, the formula?

Before clarifying his view, Mill tries to show that it 'is confirmed by the consideration of precisely those cases which might be expected to be least favourable to it, namely, those in which ratiocination is independent of any previous induction'. What are these cases?

'We have already observed that the syllogism, in the ordinary course of our reasoning, is only the latter half of the process of travelling from premisses to a conclusion. There are, however, some peculiar cases in

¹ p. 221.

which it is the whole process. Particulars alone are capable of being subjected to observation, and all knowledge which is derived from observation, begins, therefore, of necessity, in particulars, but our knowledge may, in cases of certain descriptions, be conceived as coming to us from other sources than observation. It may present itself as coming from testimony, which, on the occasion and for the purpose in hand, is accepted as of an authoritative character. Or the generalization may not be, in the ordinary sense, an assertion at all, but a command.¹

Yet Johnson says:

'In order to prevent misapprehension in regard to Mill's view of the syllogism, it must be pointed out that he virtually limited the topic of his chapter to cases in which the major premiss would be admitted by all logicians to have been established by means of induction in the ordinary sense, i.e. by the simple enumeration of instances, although many of them would have contended that such instancial evidence was not by itself sufficient. Thus all those cases in which the major was otherwise established, such as those based on authority, intuition or demonstration, do not fall within the scope of Mill's solution.'²

And Mill is right in supposing the cases 'in which ratiocination is independent of any previous induction' to require the same view of the syllogism as is required by the cases to which he has hitherto exclusively confined himself. And, as he rightly tries to confirm his view of the syllogism by a consideration of the new cases, so shall we rightly try to show that his treatment of the new cases is at fault in exactly the same way as is his treatment of the old cases.

But first we must complete our examination of his treatment of the old cases. Having arrived, in handling the new cases, at the conclusion that the syllogistic 'operation is not a process of inference, but a process of interpretation',³ Mill sums up in the following remarkable passage:

'In this last phrase we have obtained an expression which appears to me to characterize, more aptly than any other, the functions of the syllogism in all cases. When the premises are given by authority, the function of Reasoning is to ascertain the testimony of a witness, or the will of a legislator, by interpreting the signs in which the one has intimated his assertion and the other his command. In like manner, when the premises

¹ pp 221-2

² *Logic*, Pt II, pp XIX-XX

³ p 223.

are derived from observation, the function of Reasoning is to ascertain what we (or our predecessors) formerly thought might be inferred from the observed facts, and to do this by interpreting a memorandum of ours, or of theirs. The memorandum reminds us, that from evidence, more or less carefully weighed, it formerly appeared that a certain attribute might be inferred wherever we perceive a certain mark. The proposition, All men are mortal (for instance) shows that we have had experience from which we thought it followed that the attributes connoted by the term man, are a mark of mortality. But when we conclude that the Duke of Wellington is mortal, we do not infer this from the memorandum, but from the former experience. All that we infer from the memorandum is our own previous belief, (or that of those who transmitted to us the proposition), concerning the inferences which that former experience would warrant.¹

In the course of this exposition of the doctrine that the syllogism 'is not a process of inference, but a process of interpretation', Mill passes, without giving, because without taking, notice, from the diagnosis of the syllogism to the diagnosis of a different operation. The unconscious transition is made possible by the type-token² ambiguity of the word 'memorandum'.

(1) 'In like manner, when the premises are derived from observation, the function of Reasoning is to ascertain what we (or our predecessors) formerly thought might be inferred from the observed facts, and to do this by interpreting a memorandum of ours, or of theirs.' The operation here under consideration is the syllogism. And what Mill here says of it is, except for the misleading application to it of the word 'Reasoning', consistent with the doctrine which he is professedly expounding. Its function is 'to ascertain what we (or our predecessors) formerly thought might be inferred from the observed facts, and to do this by interpreting a memoran-

¹ p. 223

² *Types* are the universals of which *tokens* are the instances. Tokens are the particular shapes *produced* in writing and the particular sounds *produced* in speaking. Types are not *produced* in writing or speaking, but, being already available, are merely *used*. Words such as 'word' and 'sentence' are usually applied to types, as when we say that the same word occurs several times on a certain page. But, if asked how many words there are on the page, we should count what we usually consider merely different instances of the same word as different words. They are different *tokens* of the same *type*.

dum of ours, or of theirs'. Now one answer to the question, what we formerly thought might be inferred from the observed facts, would be that we formerly thought that the proposition, that every M is P , might be inferred. But it is surely not this answer that Mill supposes us to ascertain 'by interpreting a memorandum of ours'. On the contrary, it is from this answer that he supposes the interpretation to start. What he here calls 'a memorandum' is the proposition that every M is P . The question is of the interpretation of our formerly thinking this in the light of our latterly discovering that S_1 is M . And what Mill supposes us to ascertain 'by interpreting a memorandum of ours' is that, in formerly thinking that every M is P , we must have been thinking, albeit unconsciously, that S_1 is P .

This may be confirmed by reference to what Mill says of the new cases, 'those in which ratiocination is independent of any previous induction'. 'When the premises are given by authority, the function of Reasoning is to ascertain the testimony of a witness, or the will of a legislator, by interpreting the signs in which the one has intimated his assertion and the other his command'¹ Again, one answer to the question, what the witness testified or what the legislator willed, would be a general proposition. But the previous paragraph shows that it is not such an answer that Mill has in view:

'The real nature, however, of the supposed deductive process, is evident enough. The only point to be determined is, whether the authority which declared the general proposition, intended to include this case in it, and whether the legislator intended his command to apply to the present case among others, or not'²

(2) What has thus been seen not to be the answer that Mill supposes us to ascertain 'by interpreting a memorandum of ours' is precisely what he supposes us to ascertain by the operation to which he now abruptly passes. 'The memorandum reminds us, that from evidence, more or less carefully weighed, it formerly appeared that a certain attribute might be inferred wherever we perceive a certain mark.' This time,

¹ p. 223.

² p. 222.

what Mill calls 'the memorandum'—and he also calls it 'the proposition'—is nothing but the dried ink upon the pages of our note-book. For only this can with any plausibility be held to do what Mill says it does. And the operation here under consideration is admitted by Mill to be a process of *inference*.

The operation to whose diagnosis Mill thus passes is not a myth. It is indeed unusual, in reading, to draw inferences from the presentation of the graphic instances to the state of mind of their author. But we do sometimes draw such inferences, and we frequently accept propositions which we could defend only by drawing such inferences. In reading Mill we are less interested in the question whether Mill thought this or that than in the question whether this or that is true. In venturing to write about Mill, however, I am bound seriously to consider whether Mill thought this or that. Even so I do not find myself arguing: 'These marks are on the page before me. They were printed under the direction of a reputable publisher. They are probably similar to marks made by Mill himself. Mill would not have made such marks unless he had held these views.' Yet, if pressed for a justification of my ascription of any view to Mill, it is on such lines that I should argue. And many philosophers would put this by saying that I do *implicitly* so argue.

Suppose now that I find on a page of my note-book and in what I recognize to be my own handwriting a graphic instance of a certain proposition. If I am confident that it has been my habit to record in my note-book only such propositions as at the time of recording them seemed to me to be adequately evidenced, I can infer that the proposition whose graphic instance is presented to me formerly seemed to me to be adequately evidenced. Further, if I am now confident that whatever propositions formerly seemed to me to be, really were, adequately evidenced, I can infer that the proposition is probably true.

Granted, however, that the operation to whose diagnosis Mill thus passes is not a myth, it is not the operation whose diagnosis he has undertaken. Only because it is not, is Mill's

admission that it is inference consistent with his claim: 'The inference is finished when we have asserted that all men are mortal'. The inference which is 'finished' is the inference whose conclusion is *that S_1 is P* . The inference which besides (or as part of) 'deciphering our own notes' still 'remains to be performed afterwards' is the inference whose conclusion is *that I formerly thought that every M is P* . Even if this inference is syllogism—as Mill does not admit—it is at any rate not that syllogism whose analysis is his immediate concern. The question which he has undertaken to answer is not: How, upon examining my notes, do I ascertain that I formerly thought that every M is P ? but: How, granted that I formerly thought that every M is P , do I ascertain that thinking this is thinking, among other things, that S_1 is P ? The question which he has undertaken to answer is not a question about the relation of a token to a type, namely, of a graphic instance of the proposition that every M is P to the proposition that every M is P , but a question about the relation of one type to another, namely, of the proposition that every M is P to the proposition that S_1 is P . Do we infer that S_1 is P *from* or only *according* to the proposition that every M is P ?

The very considerations which make it consistent for Mill to admit the operation to be inference are thus seen also to make his introduction of the topic irrelevant (to say nothing of his failure to call attention to the transition to the topic). We might try to defend the digression on these lines: 'Mill thinks that the orthodox logician, in contending that syllogism is inference, is misled by the fact that there is inference subsequent to the assertion that every M is P , inference moreover which you have to perform in order to ascertain that S_1 is P (since the ascertaining that you formerly thought that every M is P is a prerequisite of the merely interpretative operation whereby you ascertain that thinking this was thinking, among other things, that S_1 is P)'. The orthodox logician confuses a prerequisite of the syllogistic operation with the syllogistic operation itself, and so comes to predicate of the latter what

is truly predicable only of the former.' Perhaps Mill does think this. But, if so, without justification. For those who say that the so-called 'major premiss' really is a premiss have never meant by 'major premiss' a token. It is the proposition, that all men are mortal—one and the same whenever written or spoken, even however written or spoken—that the orthodox logician takes to be a premiss of the conclusion that Socrates is mortal.

But, if Mill would be wrong in accusing the orthodox logician of confusing the *recovery*, with the *application*, of the major premiss, does not Mill himself confuse them? Both his failure to call attention to the transition from the diagnosis of the application to the diagnosis of the recovery (a transition which surely demands unmistakable indication) and his *ad hoc* departure from both the convention regulating his own habitual use of the word 'proposition' and the convention regulating his use in the immediately preceding sentence of the word 'memorandum' are strong evidence that Mill does confuse them. And there is further evidence.

For what has become of the disloyal account of the major premiss? What has become of the 'innumerable inferences in unforeseen cases'¹ the instructions for making which the major premiss comprises, the 'more'² which Mill has distinguished from the 'already made', the inferences which being, like all others, 'from particulars to particulars' are drawn not '*from*' but '*according to*' the major premiss? We look to § 4 for a reconciliation of the disloyal, with the loyal, account of the major premiss. But what we find is disloyalty to the disloyal account. The entire process, upon coming to know that S_1 is M, of ascertaining by reference to my notes that S_1 is P is represented as falling into two stages—an operation which is inference but is not syllogism, followed by an operation which is syllogism but is, not inference, but interpretation. That S_1 is M typifies an unforeseen case. And the disloyal account requires the major premiss to comprise instructions for making innumerable inferences in cases of which this is typical, inferences not *from*, but *according to*, the major premiss (in

¹ p. 213.

² p. 221

conformity, that is, with the instructions) and *from* the instantial evidence from which the major premiss itself was inferred.

Now where in Mill's two-stage process is the provision for these inferences which the disloyal account of the major premiss requires? The second stage is represented as not being inference at all. It is to the first stage that we must, therefore, look. But we shall look in vain. For the first stage, while it is indeed inference, is not among the inferences which the disloyal account of the major premiss requires. These are inferences which the major premiss comprises instructions for making; but the first stage of Mill's two-stage process is inference whereby we recover the major premiss and only thus make the instructions available. These are inferences '*according to*' the major premiss; but the first stage of Mill's two-stage process, while certainly not inference *from*, is just as certainly not inference *according to*, the major premiss. These inferences are 'innumerable'—as many as the 'unforeseen cases' which later come to our notice; but the inference of the first stage of Mill's two-stage process would be always the same as long as we consulted the same memorandum, however many times we performed the inference.

Nowhere is the utter failure of Mill's attempt to reconcile the disloyal, with the loyal, account of the major premiss more naked than in the last sentence of his exposition of the two-stage process. 'All that we infer from the memorandum is our own previous belief, (or that of those who transmitted to us the proposition), concerning the inferences which that former experience would warrant.'¹ Among these inferences can hardly be the inference of which this is the conclusion.

It may be protested that Mill's exposition of the two-stage process is not, as I have supposed, an attempt to reconcile the disloyal, with the loyal, account of the major premiss, but an elaboration of the loyal account. For an elaboration of the disloyal account, it may be said, we must look elsewhere, and especially we must develop Mill's remark, 'According to the

¹ p. 223.

indications of this record we draw our conclusion; which is, to all intents and purposes, a conclusion from the forgotten facts.¹ Here we at least have something which *is* one thing but is *to all intents and purposes* another. Something answering to this description seems urgently required. Perhaps the disloyal account tells us what the major premiss *is*, while the loyal account tells us what the major premiss *to all intents and purposes* is. Perhaps the 'innumerable inferences in unforeseen cases' *are* made for the first time only as the unforeseen cases come to our notice and are only *to all intents and purposes* finished when we have asserted the major premiss.

The question 'How do you know this?' and even the questions 'What is the source of your knowledge of this?' and 'What is the origin of your knowledge of this?' may be tantamount either to the question 'In knowing this what evidence are you grasping?' or to the question 'What earlier events made it possible for you to know this?' The difference between these is apt to be neglected where it is the knowing one thing earlier that makes possible the knowing another thing later. What is true only of the earlier knowledge is apt then to be treated as to all intents and purposes true also of the later knowledge.

Now Mill distinguishes, albeit insufficiently, two states of mind, an earlier state of mind in which, grasping the evidence provided by present experience of instances observed to be both M and P, we conclude that every M is P and record this conclusion in our notes, and a later state of mind in which, coming for the first time to know that S_1 is M, but having meanwhile forgotten the original evidence for our earlier conclusion that every M is P, we rely on the record of this conclusion in asserting that S_1 is P. Mill's disloyal account of the major premiss is determined by his recognition of what the later state of mind is. It is inferring that S_1 is P. But Mill does not take sufficiently seriously the question what the later state of mind *is*. He substitutes for this question the question what *to all intents and purposes* the later state of mind is. And

¹ p. 221.

in answering the latter question he conceives himself at liberty to treat the later state of mind as the same as the earlier state of mind except for the additional knowledge that S_1 is M . And this of course involves treating 'the forgotten facts' as if they were *not* forgotten.

Pretty clearly this is Mill's standpoint in the following passage, although Mill supposes himself to be justifying a negative answer to the question, 'do we, *in reality*, conclude'¹ the proposition that the Duke of Wellington is mortal from the proposition that all men are mortal, so that 'in reality' is tantamount to 'to all intents and purposes':

'The error committed is, I conceive, that of overlooking the distinction between two parts of the process of philosophizing, the inferring part, and the registering part, and ascribing to the latter the functions of the former. The mistake is that of referring a person to his own notes for the origin of his knowledge. If a person is asked a question, and is at the moment unable to answer it, he may refresh his memory by turning to a memorandum which he carries about with him. But if he were asked, how the fact came to his knowledge, he would scarcely answer, because it was set down in his note-book unless the book was written, like the Koran, with a quill from the wing of the angel Gabriel'²

Here Mill does not take seriously the question how the fact came to the person's knowledge, what his evidence was, when he refreshed his memory. If we do take this question seriously we must answer it in the very way which Mill forbids. No doubt, if the person literally and fully refreshes his memory in such a way that his state of mind is only *causally* dependent on the consultation of the memorandum, if he recalls not only making the record but also the evidence on which he relied in making it, his later state of mind is in all relevant respects the same as his earlier state of mind. If this is supposed, however, the illustration is pointless. We must, therefore, suppose that the refreshing the memory is either metaphorical or, if literal, only partial. Either the person merely infers that he must earlier have made the record and have had evidence for what he recorded; or, if he literally remembers anything, he

¹ p. 212. *Italics mine.*

² p. 213.

remembers making the record but does not remember the evidence on which he relied in making it. On either supposition the illustration is to the point. But on either supposition, and simply because the original evidence is no longer available, the person answers truly only if he answers as Mill says he scarcely would.

I conclude that Mill makes two conflicting attempts to reconcile the disloyal, with the loyal, account of the major premiss. He begins by relying on the distinction between the way in which a fact is known and the way in which it is *to all intents and purposes* known. The inference that S_1 is P , though made only when the original evidence has been forgotten, is held to be to all intents and purposes an inference from that evidence and so, to all intents and purposes, an inference finished when we have asserted the major premiss. But he ends by an attempt to take seriously the diagnosis of the inferences made only when the original evidence has been forgotten. And it is then that he substitutes for the inferences whose diagnosis is in question the inference which, instead of being an inference according to the major premiss, is an inference which merely makes the major premiss available.

Mill's fundamental position might be assailed by the following *reductio ad absurdum*: If to *assert* the major is to *assert* the conclusion, then to *believe* the major is to *believe* the conclusion. And Mill appears sometimes to countenance this implication without feeling its absurdity:

'It is unanswerably urged by the adversaries of the syllogistic theory, that the proposition, Socrates is mortal, is presupposed in the more general assumption, All men are mortal that we cannot be assured of the mortality of all men, unless we are already certain of the mortality of every individual man that if it be still doubtful whether Socrates, or any other individual we choose to name, be mortal or not, the same degree of uncertainty must hang over the assertion, All men are mortal: that the general principle, instead of being given as evidence of the particular case, cannot itself be taken for true without exception, until every shadow of doubt which could affect any case comprised with it, is dispelled by evidence *alundè* '1

Now part of what Mill is here claiming is only that unless we *know* that Socrates is mortal we do not *know* that all men are mortal. To this point I shall return. But Mill is, I think, also claiming that unless we *believe* that Socrates is mortal we do not *believe* that all men are mortal. If so, it is necessary to reply (1) that doubting whether Socrates is mortal is not the sole alternative to knowing or believing that Socrates is mortal, since the thinker may not have heard of Socrates; (2) that even doubting whether Socrates is mortal is consistent with believing that all men are mortal, since the doubt may be conditioned by doubt whether Socrates is a man. It may be protested on behalf of Mill that his claim is only that unless we *know* that Socrates is mortal we do not *know* that all men are mortal. But this claim, unless based on a rejection of the validity of induction, can be based on no better arguments than the other. Now Mill is as far as possible from rejecting the validity of induction. 'Whether, from the attributes in which Socrates resembles those men who have heretofore died, it is allowable to infer that he resembles them also in being mortal, is a question of Induction; and is to be decided by the principles or canons which we shall hereafter recognise as tests of the correct performance of that great mental operation',¹ and decided in the affirmative. Again, 'The proposition that the Duke of Wellington is mortal, is evidently an inference; it is got at as a conclusion from something else; but do we, in reality, conclude it from the proposition, All men are mortal? I answer, no.'² Mill then is not challenging the validity of an inference to the conclusion that S_1 , observed to be M but not observed to be P, is P, from the evidence that $S_2, S_3 \dots$, which are M, are P. It follows that there is no *relevant* difference between the *knowing* and the *believing* that all men are mortal.

The same failure to appreciate the indefiniteness of much that may be entertained or believed or even known appears in Mill's treatment of the cases 'in which ratiocination is independent of any previous induction'.³ Here, at least, the

¹ p. 233.² p. 212.³ p. 222.

validity of induction cannot be in question, since induction is not in question:

'The real nature, however, of the supposed deductive process, is evident enough. The only point to be determined is, whether the authority which declared the general proposition, intended to include this case in it; and whether the legislator intended his command to apply to the present case among others, or not. This is ascertained by examining whether the case possesses the marks by which, as those authorities have signified, the cases which they meant to certify or to influence may be known. The object of the inquiry is to make out the witness's or the legislator's intention, through the indication given by their words.'¹

But we can without any examination at once deny that 'the legislator intended his command to apply to the present case among others'. We must be wary of formulating this denial by saying. 'The legislator did not intend his command to apply to the present case.' For that is tantamount to. 'The legislator did intend his command not to apply to the present case', just as 'I do not think that this is so' is tantamount to 'I do think that this is not so'. But what we want to make clear is that both the proposition, that the legislator intended his command to apply to the present case, and the proposition, that the legislator intended his command not to apply to the present case, are false. And they must be false simply because the legislator, *ex hypothesi*, did not know of the present case. We are justified in saying that, if the present case bears the required marks, if, that is, the legislator intending that every M be P, the present case is M, then the application of the command to the present case would be *in accordance with* the legislator's intention. It might seem that we should be justified in saying that, had the legislator known of it, he would have intended his command to apply to the present case, as we certainly are justified in saying that, had you, in knowing that every M is P, also known that S_1 is M, you would have known that S_1 is P. Since the consequents of these hypothetical propositions are no more fulfilled than are

¹ pp. 222-3.

the antecedents, it would still not at all follow that the legislator did intend his command to apply to the present case. But we are not really justified in saying even that, had the legislator known of it, he would have intended his command to apply to the present case. And it is worth while to substantiate the rejection of this formula because we shall at the same time be substantiating the rejection of the formula on which Mill relies. The legislator might intend both (1) that every thief be put to death and (2) that his son attain three score years and ten. If, then, his son turned thief, the application to his case of the legislator's command would be in accordance with intention (1) but contrary to intention (2), and the failure to apply the command would be in accordance with intention (2) but contrary to intention (1). But it could not be true that, had the legislator foreseen the case, he would both have intended that his son be put to death and have intended that his son attain three score years and ten. The anticipation of the case must involve the abandonment of at least one of the conflicting intentions. Similarly, it could not be true that the legislator *did* both intend that his son be put to death and that his son attain three score years and ten. Mill's treatment of the new cases confuses 'The legislator intends that every M be P' with 'Every M is intended by the legislator to be P'. Similarly, his treatment of the old cases confuses 'We know or believe that every M is P' with 'Every M is known or believed by us to be P'. The confusion of course requires that, where S_1 is M, S_1 is intended or known or believed to be P.

But Mill can do better. 'I do not say that a person who affirmed, before the Duke of Wellington was born, that all men are mortal, *knew* that the Duke of Wellington was mortal; but I do say that he *asserted* it.'¹ And Mill would no doubt

¹ p 212 note Yet later logicians, shirking the task of refuting Mill's contention that the *assertion* of the major is the *assertion* of the conclusion, are content to rest the defence of syllogistic reasoning against the charge of *petitio principii* on the claim that we can *know* the major without *knowing* the conclusion, e.g. Venn, *Empirical Logic*, chap. xv

Welton dismisses Mill's distinction too summarily (*Manual of Logic*, vol. 1, p. 407) 'But, as assertion is an act of judgment, it cannot be unconscious, and to say, as Mill does, that a person can assert a fact which he does not *know* is not

have disclaimed the view that the person *believed* that the Duke was mortal. Mill's doctrine at its best is that, where we do not yet know or believe that S_1 is M , we in asserting that every M is P assert, but without either knowing or believing, that S_1 is P . And before leaving this first account of the nature of the syllogism it may be worth while to apply this doctrine to the solution of a problem which Mill insufficiently notices.

Granted that Mill holds that syllogism resembles immediate inference in being merely apparent inference, we should still expect that, as the orthodox logician treats syllogism and immediate inference as different types of real inference, so would Mill treat syllogism and immediate inference as different types of merely apparent inference. But the orthodox distinction of mediate (including syllogistic), from immediate, inference depends on the claim that the minor premiss is indispensable. To be able to draw a closely corresponding distinction of mediate, from immediate, *apparent* inference Mill would need to hold not that the bare assertion of the major premiss, but that only the conjunct assertion of both the major and the minor, is the assertion of the conclusion. But we have seen that Mill tries to substantiate the position 'that in every syllogism, considered as an argument to prove the conclusion, there is a *petitio principii*'¹ by taking the more ambitious line that even the bare assertion of the major premiss is the assertion, among other things, of the conclusion. And this seems to require that the derivation of the conclusion from the major premiss without reference to the minor premiss would be an immediate inference of the type where 'the fact asserted in the conclusion'² is 'part of the fact, asserted in the original proposition'—the type to which conversion *per accidens* belongs. Syllogism, accordingly,

only to talk very bad psychology but to fall into an absolute contradiction in terms' That *this* will not do, we can satisfy ourselves by considering the nature of a lie. In order to appreciate Mill's position, however, what we must consider is the use of a symbol by a speaker to whom the meaning of the symbol is not fully known. Mill holds that what is *asserted* depends solely on the meaning of the proposition, whether the speaker knows it or not. Sound or unsound, this cannot be dismissed as either bad psychology or self-contradiction.

¹ p. 210

² p. 183.

would resemble immediate inference not only in being merely apparent but also in being immediate, the minor premiss being superfluous. And Mill would be finding fault with the traditional doctrine of the syllogism on two counts. Where the traditional doctrine takes the minor premiss to be *indispensable* to *real* inference, Mill would be protesting that the minor premiss is *not indispensable* even to *merely apparent* inference.

But the doctrine, that though we assert, we may yet neither know nor believe, that S_1 is P, might be here pressed into service. In the interpretative operation which he holds syllogism to be, Mill could ascribe to the minor premiss, recording the new discovery that S_1 is M, the function of showing that in asserting that every M is P we are asserting, among other things, that S_1 is P. The difference, then, between syllogistic, and immediate, apparent inference would be this. To know or believe the premiss of an immediate inference is to know or believe the conclusion. But to know or believe the major premiss of a syllogism is not, unless you also know or believe the minor premiss, to know or believe the conclusion. Of immediate inference Mill says that 'there is in the conclusion no new truth, nothing but what was already asserted in the premises'.¹ This would hold also of the relation of the conclusion, to the major premiss, of a syllogism. But Mill adds: 'and obvious to whoever apprehends them'. This would hold of the relation of the conclusion, not to the major premiss, but only to the conjunction of the major premiss and the minor premiss, of a syllogism.

To the question which I have here tried to answer for Mill, his own answer, and a different answer, may seem to be given in § 6. But the question of § 6 is, 'since the syllogism is not the universal type of the reasoning process, what is the real type'.² And the relevance of the minor premiss to this question is indicated thus:

'This resolves itself into the question, what is the nature of the minor premise, and in what manner it contributes to establish the conclusion: for as to the major, we now fully understand, that the place which it

¹ p 183

² p 229

nominally occupies in our reasonings, properly belongs to the individual facts or observations of which it expresses the general result, the major itself being no real part of the argument, but an intermediate halting-place for the mind, interposed by an artifice of language between the real premises and the conclusion, by way of a security, which it is in a most material degree, for the correctness of the process. The minor, however, being an indispensable part of the syllogistic expression of an argument, without doubt either is, or corresponds to, an equally indispensable part of the argument itself, and we have only to inquire what part.¹

Now Mill does indeed here concede that the minor premiss is 'an indispensable part of the syllogistic expression of an argument'. But he does not work this out. Instead, he asks what represents the minor premiss, not in the interpretative operation which he holds syllogism to be, but in the real inductive inference which he holds syllogism not to be. Here a transformed minor appears in company with a transformed major² in an operation which neither is, nor is thought by Mill to be, syllogism.

In the footnote at the end of § 8, however, Mill says that both his reviewer and he admit 'that when a new individual, Socrates, is brought within the field of our knowledge by means of the minor premise, we learn that we have already made an assertion respecting Socrates without knowing it: our own general formula being, to that extent, for the first time *interpreted* to us'.³ Again, in reply to the objection that he 'tacitly assumes the superfluity of the minor', Mill says:

'The objection would be well grounded if the assertion that the major premise includes the conclusion, meant that it individually specifies all it includes. As however the only indication it gives is a description by marks, we have still to compare any new individual with the marks, and to show that this comparison has been made, is the office of the minor.'

¹ pp 229-30

² For which see p. 232.

³ p 238

CHAPTER X

SECOND ACCOUNT OF SYLLOGISM

FROM what has so far been said we might suppose Mill to ascribe to the major premiss no function beyond that of bridging the temporal gap between either the assertion that every M is P or the intention that every M be P and the discovery that S_1 is M. Not even to 'record all that we have observed, together with all that we infer from our observations'¹ can be viewed as a further function of the major premiss. For, granted that the major premiss may also do this, it does this only *qua* universal proposition and not *qua* major premiss. We might suppose, then, that it is solely on the ground that the syllogistic interpretation of the major premiss enables us to obey 'instructions for making innumerable inferences in unforeseen cases',² that Mill dissociates himself from those who 'have been led to impute uselessness and frivolity to the syllogistic theory itself'³ In § 5, however, the function of bridging a temporal gap is relegated to the 'ulterior uses' of syllogism which 'hardly require illustration'.⁴ And it is on the concession that the recognition that every M is P may be important even where we are concluding about an object already observed to be M while the ultimate evidence is still available, that Mill bases his 'protest, as strong as that of Archbishop Whately himself, against the doctrine that the syllogistic art is useless for the purposes of reasoning'.⁵

Only in the strength of this protest, not at all in the mode of justifying it, does Mill profess to go along with Whately. There is, however, an unacknowledged and disconcerting resemblance between Mill's concession that the value 'of the syllogistic form, and of the rules for using it correctly, does not consist in their being the form and the rules according to which our reasonings are necessarily, or even usually, made; but in their furnishing us with a mode in which those reasonings may always be represented, and which is admirably calculated, if

¹ p 213

² Ibid

³ p 210

⁴ p 228

⁵ p 225

they are inconclusive, to bring their inconclusiveness to light'¹ and Whately's claim 'that *all* Reasoning, on whatever subject, is one and the same process, which may be clearly exhibited in the form of Syllogisms'² and that all arguments are 'capable of being Syllogistically expressed'. It is of the utmost importance to see that the resemblance is verbal, the difference real. What Whately calls 'the form of Syllogisms' is a form of *speech*. He allows that we frequently express our arguments in non-syllogistic language. In particular, we have recourse to enthymeme. Nor does Whately condemn the choice of non-syllogistic language. But he insists that, only by expressing our arguments in syllogistic language, can we succeed in *saying* what we must, if our arguments are valid, be *thinking*.

On the other hand, what Mill calls 'the syllogistic form' is a form not of speech but of *thought*. Although Mill says: 'An induction from particulars to generals, followed by a syllogistic process from those generals to other particulars, is a form in which we may always *state* our reasonings if we please'³ (he has also called syllogism a 'mode of stating the argument'), he corrects this inaccuracy by proceeding: 'It is not a form in which we *must* reason, but it is a form in which we *may* reason, and into which it is indispensable to throw our reasoning, when there is any doubt of its validity'⁴. But, if we are to ascribe to Mill the view that syllogism is not reasoning, this correction presents a new difficulty. The syllogistic form is a form of *thought* and not of *speech*; but the thought of which it is a form ought to be, not *reasoning*, but *interpretation*. How then does Mill come to write this sentence? (1) What is said to be 'a form in which we *may* reason, and into which it is indispensable to throw our reasoning, when there is any doubt of its validity' is not 'the syllogistic form' but 'an induction from particulars to generals, followed by a syllogistic process from those generals to other particulars'. This operation consists of two steps, one of which, 'an induction from particulars to generals', is reasoning but is not syllogism, and

¹ p. 227³ pp. 227-8 My italics² *Elements of Logic*, 8th ed., p. 230⁴ p. 228

the other of which, 'a syllogistic process from those generals to other particulars', is syllogism but is not reasoning. In the process of showing how, by playing what part in what complex operation, syllogism enables us to test reasoning, Mill fails adequately to observe the distinction between the syllogism itself and the complex operation in which it plays a part. (2) Further, he momentarily describes the complex operation in a way appropriate only to its non-syllogistic element. For he does not mean merely that we may reason to generals *instead of to a particular*, but that we may besides doing this *go on to check our reasoning to a particular* by recognizing that the assertion of the general is the assertion, among other things, of this particular. And this recognition is not, according to Mill, reasoning. ('The same considerations would make it unsatisfactory to correct 'mode of stating the argument', on p. 227, by substituting 'mode of arguing'.')

Can we, then, interpret Mill's account of the syllogism in § 5 as, apart from momentary lapses, a supplement to, not an abandonment of, his account of the syllogism in §§ 2-4? In particular, can we represent the new account as, like the old, dominated by loyalty to the usual definition of the universal proposition? Does Mill still think that 'a general truth is nothing but an aggregate of particular truths'?¹

Mill begins by reformulating as follows the thesis which he considers himself to have already established:

'In the above observations it has, I think, been shown, that, though there is always a process of reasoning or inference where a syllogism is used, the syllogism is not a correct analysis of that process of reasoning or inference, which is, on the contrary, (when not a mere inference from testimony) an inference from particulars to particulars, authorized by a previous inference from particulars to generals, and substantially the same with it, of the nature, therefore, of Induction'²

This passage presents, in the first place, a terminological difficulty whose resolution is indispensable to an understanding of the sequel. Already in the sentence 'a general truth is but

¹ p. 213.

² p. 225

an aggregate of particular truths' Mill has used 'general' for 'universal' and 'particular' for 'singular'. Yet Mill has nowhere warned us of any intention to abandon his acceptance, in Book I, of the distinction between singular, universal, and particular propositions, and his acquiescence even in the view that singular propositions 'in the Syllogism follow the same rules as Universal',¹ a view which obviously requires an account of the syllogism carefully to preserve the distinction between singular and particular propositions. The explanation of our terminological difficulty is, I think, as follows. Mill inherits the expressions 'reasoning from particulars to generals' and 'reasoning from generals to particulars'.² Now in these expressions I take the distinction between 'particulars' and 'generals' to be a distinction, not between two kinds of *propositions*, but between two kinds of supposed possible *subjects of propositions*. What are called 'particulars' are *instances or cases*; what are called 'generals' are the entities of which the former are instances or cases. Now a claim about a particular (in this sense) would be made in a singular proposition; and a claim about a general (in this sense) would be made in a universal proposition. Accordingly, reasoning from particulars to generals is reasoning from singular premisses to universal conclusions. This makes it possible for Mill negligently to drift into the habit of calling propositions about particulars 'particulars' and propositions about generals 'generals'.

There is, however, more than this in our terminological difficulty. In the passage now under examination and frequently in the sequel Mill distinguishes between 'an inference from particulars to particulars' and 'a previous inference from particulars to generals' where we should expect him to say rather 'to *a* particular' and 'to *a* general'. Of this anomaly the only explanation I can offer is that the habit of distinguishing 'to particulars' and 'to generals', intelligibly enough formed where Mill is distinguishing pluralities, as in the expressions 'reasoning from particulars to generals' and 'reasoning from generals to particulars', survives through mere inadvertence

¹ p 94, note

² p 186

where he is distinguishing only one inference of the one kind from only one inference of the other kind.

Whatever the explanation of Mill's language, I shall proceed upon the supposition that the difference between 'an inference from particulars to particulars' and 'an inference from particulars to generals' is that between an inference from a conjunction of singular propositions to *a singular conclusion* and an inference from a conjunction of singular propositions to *a universal conclusion*.

And now we are ready to examine a more than terminological difficulty Mill has claimed: 'All inference is from particulars to particulars'.¹ Yet he, in saying 'Not only *may* we reason from particulars to particulars without passing through generals, but we perpetually do so reason',² has already seemed by implication to admit that some reasoning is 'from particulars to generals'. For when we do elect to 'pass through generals' it is hard to see how Mill can avoid admitting that we at least begin by reasoning 'from particulars to generals'. Now the more than terminological difficulty presented by the passage now under examination is that Mill does expressly admit this. He does expressly admit the occurrence, and even the value, of 'inference from particulars to generals'. How then can he also claim: 'All inference is from particulars to particulars'?

It is easy enough to find an answer—and, so far as it goes, it is the true answer—in Mill's view that 'a general truth is but an aggregate of particular truths'.³ Inference to generals is inference to particulars. But what then can be the nature of Mill's distinction between 'inference to particulars' and 'inference to generals'? The difference can be only (1) the difference between drawing only *one* and drawing *all* of the 'possible inferences from a given set of particulars',⁴ supplemented by (2) the fact that in inferring to generals we throw 'the whole body of possible inferences from a given set of particulars, into one general expression'.

Now, if this is the whole of the difference between an

¹ p. 221.

² p. 215.

³ p. 213.

⁴ p. 225

inference from particulars to particulars and the corresponding inference from particulars to generals, we can have no hesitation in allowing Mill's claim that the inference to particulars is 'substantially the same with' the inference to generals. But what is Mill's justification for saying that the inference to particulars is 'authorized by' the inference to generals? At the beginning of § 5, where Mill is still only reformulating the thesis of §§ 2-4, where, accordingly, it is a '*previous*' inference to generals that 'authorizes' the inference to particulars, the point of appealing to the inference to generals is merely that the original evidence is no longer available. The major premiss merely deputizes for 'the forgotten facts'. But the novelty of the thesis of § 5, that 'the syllogistic form is an indispensable collateral security for the correctness of the generalization itself',¹ where, it must be remarked, what is called 'the generalization' is not the inference to generals but the inference to particulars, is just this: While, as before, all that the interpretative operation, which is syllogism, of itself accomplishes is the task of ascertaining that the asserting that every M is P (the conclusion of an inference to generals) is the asserting, among other things, that S₁ is P (the conclusion of an inference to particulars), Mill makes a new claim about the advantage of ascertaining this. The advantage is not merely that, having forgotten the observed instances of the concomitance of M and P, we can only in this indirect way ascertain that S₁ is P, but that, although we both have the observed instances of the concomitance of M and P still before us and already know that S₁ is M, we can, if the validity of the inference to particulars is in doubt, guarantee its conclusion by syllogistically deriving it from the conclusion of the inference to generals. For the simple question, asked in face of the only ultimate evidence, whether from these instances of the concomitance of M and P we can validly infer that S₁ is P, we substitute the complex question: (1) What is the whole body of propositions validly inferable from these instances? (2) Is the proposition, that S₁ is P, among these? And it is because he

¹ p. 225.

thinks that the latter part of this complex question is syllogistically answered that Mill claims that 'the syllogistic form is an indispensable collateral security for the correctness of the generalization itself'.

But, if the syllogism is to be in this way 'a mode of verifying any given argument',¹ if an inference to particulars is to be 'authorized by'² an inference to generals where, the only ultimate evidence being accessible, the validity of the inference to particulars is nevertheless in doubt, then the validity of the inference to generals ought not itself to be in doubt. Accordingly, when we recall what 'is unanswerably urged by the adversaries of the syllogistic theory',³ namely, 'that if it be still doubtful whether Socrates, or any other individual we choose to name, be mortal or not, the same degree of uncertainty must hang over the assertion, All men are mortal: that the general principle, instead of being given as evidence of the particular case, cannot itself be taken for true without exception, until every shadow of doubt which could affect any case comprised with it, is dispelled by evidence *ahundè*', we must find Mill inconsistent in now representing, not only the conclusion, that the Duke of Wellington is mortal, drawn after the ultimate evidence has been forgotten, but also the conclusion, that Socrates is mortal, drawn while the ultimate evidence is still accessible, as capable of being 'authorized by' an inference to the conclusion, that all men are mortal. The inconsistency is not in the least avoided by Mill's claim that the operation which connects the two inferences is interpretation and not reasoning. Whatever the nature of this operation, if the validity of the inference to generals must be involved in the same doubt as the validity of the inference to particulars, the latter cannot be 'authorized by' the former.

When, however, we examine Mill's account of the advantages of comparing an inference to particulars with the corresponding inference to generals, we find a different but connected inconsistency. Mill does not, as his new thesis seems to require, go back on his earlier concession to 'the adversaries

¹ p. 228.

² p. 225.

³ p. 210.

of the syllogistic theory'. Instead, he fails to stand by his newly professed thesis. "This throwing of the whole body of possible inferences from a given set of particulars, into one general expression, operates as a security for their being just inferences, in more ways than one."¹ But the 'one general expression' the formulation of which 'operates as a security' is not the major premiss of the relevant syllogism

(1) The aggregate of particulars which is the conclusion of an inference to generals is only a selection from the aggregate of particulars which Mill holds to be the major premiss of the corresponding syllogism. The major premiss comprises, even if we disregard the 'instructions for making innumerable inferences in unforeseen cases',² at least 'all that we have observed, together with all that we infer from our observations'. It is, therefore, 'a general proposition including both sets of cases, the unknown and the known',³ where by 'unknown' must be understood 'unknown otherwise than by inference'. Mill's objection against viewing it as a genuine premiss, "Turn it in what way we will, this seems to me to be asserting that a thing is the proof of itself",⁴ is based on his claim that the major premiss comprises the 'unknown' cases. And, in his account of what he takes to be the true type of the reasoning process, Mill substitutes 'the major premise divested of the *petitio principii*, and cut down to as much as is really known by direct evidence'.⁵ The same objection would lie against viewing as the conclusion a proposition comprising the 'known' cases. As the premiss must be restricted to that part of the major premiss which records 'all that we have observed', so must the conclusion be restricted to the remainder of the major premiss, namely, to that part which records 'all that we infer from our observations'.

There being thus difference between the conclusion of an inference to generals and the major premiss of the corresponding syllogism, we cannot doubt that it is the former and not the latter whose formulation Mill now represents as serviceable. For 'to place before our minds, in its full extent,

¹ p 225² p 213³ p 237, note.⁴ Ibid⁵ p 232

the whole of what our evidence must prove if it proves anything',¹ to throw 'the whole body of possible inferences from a given set of particulars, into one general expression',² to 'place before ourselves an entire class of facts—the whole contents of a general proposition, every title of which is legitimately inferrible from our premises, if that one particular conclusion is so',³ is to formulate the conclusion of an inference to generals and is not to formulate what Mill takes to be the major premiss of the corresponding syllogism. If Mill also writes as if the general proposition in question were the major premiss of the corresponding syllogism, this can be only because he either overlooks the difference or deems it irrelevant.

(2) But the proposition which 'operates as a security' in what Mill considers the most important way (for he distinguishes 'more ways than one') cannot be accurately identified even with the conclusion of an inference to generals. What Mill ought to say is that a selection from the aggregate of particulars which is the conclusion of an inference to generals 'operates as a security' for the remainder of the aggregate. The individual case, to which we conclude by our inference to particulars, is tested by bringing 'under our view not one parallel case only, but all possible parallel cases at once'.⁴ But these are not 'all cases to which the same set of evidentiary considerations are applicable', but are only all such cases other than the case which we are testing

On these distinctions and especially on distinction (2) it may seem hypercritical to insist. Yet they have, and especially distinction (2), an important bearing on the question whether Mill makes good his claim that 'the syllogistic form is an indispensable collateral security for the correctness of the generalization itself'. I have said that the part assigned to the syllogism is that of ascertaining that the assertion of the conclusion of a certain inference to generals is the assertion, among other things, of the conclusion of the inference to particulars which is being tested. Now distinction (1), between the conclusion of an inference to generals and the major

¹ p. 225.² Ibid³ p. 226.⁴ p. 227.

premiss of the corresponding syllogism, does not require the rejection of Mill's claim that the syllogism plays this part. For the aggregate of particulars which is the conclusion of an inference to generals, granted that it is only a selection from the aggregate of particulars which Mill holds to be the major premiss of the corresponding syllogism, is nevertheless a selection comprising the conclusion of that inference to particulars which is being tested. What 'nominally occupies in our reasonings'¹ the place which according to Mill 'properly belongs to the individual facts or observations of which it expresses the general result' is, for example, the proposition, that all men are mortal. But, granted that the conclusion of that inference to generals which according to Mill 'operates as a security' for an inference to the conclusion, that Wellington is mortal, is not the proposition, that all men are mortal, but the proposition, that all men other than 'John and Thomas, and every other person we ever heard of in whose case the experiment had been fairly tried'² are mortal, we have only to take as our middle term, instead of 'man', 'man other than John and Thomas and . . .', in order to construct a syllogism with the conclusion of the inference to generals as its major premiss. Moreover, in saying 'all men' instead of 'all men other than John and Thomas and . . .', we can plead that, granted that we are combining what we observe with what we infer, we are doing so in fewer words than those which it would be necessary to use in order to confine ourselves to what we infer.

On the other hand, distinction (2), between the conclusion of the inference to generals and the proposition which 'operates as a security' in what Mill considers the most important way, *does* require the rejection of Mill's claim that the syllogism plays the part assigned. For, if the aggregate of particulars which 'operates as a security' does not comprise the conclusion of that inference to particulars which is being tested, the assertion of the former is not the assertion of the latter. And the comparison of the two conclusions is, therefore,

¹ p. 229.

² pp. 213-14

wrongly presented as 'a subsequent application of that general proposition to the unknown case',¹ 'a syllogistic process from those generals to other particulars'.² Ascertaining that, if I am justified in asserting that all men other than John and Thomas and . . . are mortal, then I am justified in asserting that Wellington is mortal, might be syllogizing. Ascertaining that, if I am justified in asserting that all men other than John and Thomas and . . . and Wellington are mortal, then I am justified in asserting that Wellington is mortal, cannot be syllogizing.

Even, then, if Mill succeeds in showing that the conclusion of one inference operates as a security for the conclusion of another, his thesis that 'the syllogistic form is an indispensable collateral security' is not thereby supported.

The scope of this objection I have confined to that proposition which operates as a security in what Mill considers the most important way. I admit that, among the ways in which the conclusion of an inference to particulars can according to Mill be tested, there is one which requires the identification of the proposition which operates as a security with the conclusion of an inference to generals. When Mill says that 'the general principle presents a larger object to the imagination than any of the singular propositions which it contains',³ he rightly takes the comparison to be between a part of what our evidence would prove and, not the remainder, but the whole including this part. Indeed, where 'the whole body of possible inferences from a given set of particulars'⁴ is small, it would even be important to press this point. Suppose that there are only two possible inferences to particulars, there being only two M's other than those known by observation to be P. Neither inference need be 'felt as of greater importance than'⁵ the other. The two together might still be 'felt as of greater importance than' either alone.

But it is not this part of his view that Mill stresses. 'There is another, and a more important, advantage.'⁶ Mill should,

¹ p 227

⁴ p 225.

² pp 227-8.

⁵ p. 226.

³ pp 225-6.

⁶ Ibid

I think, say *two* advantages. And both are, I think, provided by a comparison of a part of what our evidence would prove with, not the whole, but only the remainder. It is by recognizing that our evidence, if it would prove the conclusion of our inference to particulars, would also prove *other* conclusions, that we both correct bias and become alive to further ways in which our inference might, if unsound, be discredited

Mill allows his account of the former of these advantages to be smothered by his account of the latter.

'In reasoning from a course of individual observations to some new and unobserved case, which we are but imperfectly acquainted with (or we should not be inquiring into it), and in which, since we are inquiring into it, we probably feel a peculiar interest—there is very little to prevent us from giving way to negligence, or to any bias which may affect our wishes or our imagination, and, under that influence, accepting insufficient evidence as sufficient'

But in what follows Mill does not show how this bias may be corrected, but only how in spite of the bias we might find our conclusion to be unsound.

'But if, instead of concluding straight to the particular case, we place before ourselves an entire class of facts—the whole contents of a general proposition, every title of which is legitimately inferrible from our premises, if that one particular conclusion is so; there is then a considerable likelihood that if the premises are insufficient, and the general inference, therefore, groundless, it will comprise within it some fact or facts the reverse of which we already know to be true, and we shall thus discover the error in our generalization by a *reductio ad impossibile*'²

And this is all that his illustration shows:

'Thus if, during the reign of Marcus Aurelius, a subject of the Roman empire, under the bias naturally given to the imagination and expectations by the lives and characters of the Antonines, had been disposed to expect that Commodus would be a just ruler, supposing him to stop there, he might only have been undeceived by sad experience. But if he reflected that this expectation could not be justifiable unless from the same evidence he was warranted in concluding some general proposition, as, for instance, that all Roman emperors are just rulers; he would immediately have thought of Nero, Domitian, and other instances, which,

¹ p. 226.

² Ibid.

showing the falsity of the general conclusion, and therefore the insufficiency of the premises, would have warned him that those premises could not prove in the instance of Commodus, what they were inadequate to prove in any collection of cases in which his was included¹

Here, moreover, 'the bias naturally given to the imagination and expectations by the lives and characters of the Antonines' does not illustrate 'bias which may affect our wishes or our imagination'. The bias to which Mill has inadvertently passed is determined by the evidence. But the bias with which Mill began is determined by the case concerning which we conclude in our inference to particulars. The correction of such bias would be illustrated by the familiar precept to test my views about *my* rights and *your* duties by asking myself whether I am ready to conclude by parity of reasoning to *your* rights and *my* duties. Or an enemy of the Duke of Wellington might have insured that, in concluding that the Duke of Wellington was mortal, he was not unduly influenced by his wishes, by asking himself whether he was convinced of his own mortality.

It is, however, on the claim that there is 'a considerable likelihood that if the premises are insufficient, and the general inference, therefore, groundless, it will comprise within it some fact or facts the reverse of which we already know to be true; and we shall thus discover the error in our generalization by a *reductio ad impossibile*',² that Mill rests his case. It is this claim alone that he finds worthy of mention in his resumptive statement:

'If, therefore, any fact fairly coming within the range of one of these general propositions, and consequently asserted by it, is known or suspected to be other than the proposition asserts it to be, this mode of stating the argument causes us to know or to suspect that the original observations, which are the real grounds of our conclusion, are not sufficient to support it. And in proportion to the greater chance of our detecting the inconclusiveness of our evidence, will be the increased reliance we are entitled to place in it if no such evidence of defect shall appear.

The value, therefore, of the syllogistic form, and of the rules for using it correctly, does not consist in their being the form and the

¹ pp 226-7.

² p 226

rules according to which our reasonings are necessarily, or even usually, made, but in their furnishing us with a mode in which those reasonings may always be represented, and which is admirably calculated, if they are inconclusive, to bring their inconclusiveness to light¹

Mill's claim is only that 'in proportion to the greater chance of our detecting the inconclusiveness of our evidence, will be the increased reliance we are entitled to place in it if no such evidence of defect shall appear', only that there is 'a considerable likelihood that if the premises are insufficient, and the general inference, therefore, groundless, it will comprise within it some fact or facts the reverse of which we already know to be true' Even this claim is excessive. There might easily be no likelihood Not one of the parallel cases might be any more accessible than the case to be tested. What is worse, only if in selecting the evidence for our inference to particulars we have proceeded negligently, is it possible for a parallel case to be accessible otherwise than by inference. The inference to particulars whose conclusion is, that Commodus would be a just ruler, is defective, not because it is an inference to particulars, but because it is based on a record of observations concerning only the Antonines. That an inference to particulars, though based on all the available evidence, can be confirmed by an inference to generals, cannot in this way be shown.

It must be further objected that the connexion between the conclusion of an inference to generals and the conclusion of an inference to particulars, which according to Mill's account requires ascertaining, is not that the assertion of the former is the assertion among other things of the latter, but that the former 'is legitimately inferrible from our premises, if that one particular conclusion is so' Now this cannot be ascertained by ascertaining merely that the assertion of the former is the assertion, among other things, of the latter. There would always be innumerable propositions, whose assertion would be the assertion among other things of the conclusion of our inference to particulars, but whose legitimate inferability from our premisses is not required by its legitimate inferability.

The conclusion of our inference to particulars we are of course supposed to have already before us. And the question which we have to answer is the question what else could be concluded by an inference 'substantially the same'. When Mill represents the more cautious thinker as being warned 'that those premises could not prove in the instance of Commodus, what they were inadequate to prove in any collection of cases in which his was included', he of course means a collection of Roman emperors. But our recognition of what other cases are parallel, to what other cases 'the same set of evidentiary considerations are applicable', depends on our recognition that S_1 's being M is all that is relevant to S_1 's being P. Only by seeing that the substance of our inference to particulars is an inference to the conclusion, that being M involves being P, that the conclusion of our inference to particulars is, accordingly, justified only because S_1 is a case of M, can we see what other cases would be parallel, by what inference to generals we must test our inference to particulars. The syllogism, therefore, is not used in order to ascertain what inference to generals would be justified if our inference to particulars was justified. On the contrary, our inference to particulars was already an inference to generals followed by a syllogism. Because it was, it can be checked at either stage. And one way of checking the first stage would be, by further syllogisms, to draw further inferences to particulars, and ask ourselves whether we are equally confident of their conclusions. Thus the syllogism may be used in eliciting parallel cases, but only in the same way as that in which it must be used in the original inference to particulars.

CHAPTER XI

INFLUENCE OF EPISTEMOLOGICAL STANDPOINT

WHATEVER our estimate of Mill's loyalty or disloyalty to the usual definition of the universal proposition in his own accounts of the syllogism, in §§ 2-4 and in § 5, we shall agree that his rejection of the orthodox account of the syllogism appears to be determined only by his acceptance of that form of the doctrine 'that in every syllogism, considered as an argument to prove the conclusion, there is a *petitio principii*', in which the assertion of the major premiss is represented as the assertion among other things of the conclusion. Since it is only his loyalty to the usual definition of the universal proposition that necessitates his belief that the assertion of the major premiss is the assertion of the conclusion, Mill's loyalty to the usual definition of the universal proposition thus appears as the ultimate ground of his rejection of the orthodox account of the syllogism.

What, then, has become of my claim that Mill's *System of Logic* is an elaborate attempt to defend epistemological empiricism at its most vulnerable point, and what has become of my more specific claim that the unity of Mill's *System of Logic* is derived from his attempt to meet the objection that q cannot be validly inferred from p unless \bar{p} or q is self-evident? In order to uphold these claims it would be necessary to represent Mill as driven into the position that the alternative proposition (A), whose alternants are (i) the contradictory of the conjunctive proposition whose conjuncts are the major premiss and the minor premiss, (ii) the conclusion, is a merely verbal proposition; and as driven into this position in an attempt to explain the seeming self-evidence of this alternative proposition. Instead, Mill has been represented as driven into the different position that the alternative proposition (B), whose alternants are (i) the contradictory of the major premiss, (ii) the conclusion, is a merely verbal proposition; and as

driven into this position, not in an attempt to explain the seeming self-evidence of this alternative proposition (which is not, by the orthodox account of the syllogism, required to be self-evident), but in an attempt to enforce, independently of any epistemological prepossession, the usual definition of the universal proposition.

But it is, in the first place, possible to occupy both of these positions. Indeed, anybody who holds that the alternative proposition (B), whose alternants are (i) the contradictory of the major premiss, (ii) the conclusion, is a merely verbal proposition may be expected to hold that *a fortiori* the alternative proposition (A), whose alternants are (i) the contradictory of the conjunctive proposition whose conjuncts are the major premiss and the minor premiss, (ii) the conclusion, is a merely verbal proposition. And, in the second place, however disconnected the contention that the mere verballity of alternative proposition (A) is required by its seeming self-evidence and the contention that the mere verballity of alternative proposition (B), and, therefore, of alternative proposition (A), is required by the usual definition of the universal proposition, at least the two contentions are not conflicting. Nor is it at all incredible that a logician, who holds that the mere verballity of alternative proposition (A) is required by its seeming self-evidence, should on that account be only the more willing to hold that the mere verballity of alternative proposition (B) is required by the usual definition of the universal proposition.

'It must be granted that in every syllogism, considered as an argument to prove the conclusion, there is a *petitio principii*.'¹ Mill gives two independent reasons for claiming that this must be granted. Of these two reasons only one is given in § 2. It is this reason that 'is unanswerably urged by the adversaries of the syllogistic theory', namely, that the assertion of the major premiss is the assertion, among other things, of the conclusion. And we have seen that this is a corollary from the usual definition of the universal proposition. Now that which 'is unanswerably urged by the adversaries of the syllogistic

¹ p. 210.

theory' is not admitted by 'the defenders of the syllogistic theory', who, on the contrary, 'though unable to dispute it, have usually exhibited a strong disposition to explain it away'. But in § 1 Mill represents the conclusion 'that nothing ever was, or can be, proved by syllogism, which was not known, or assumed to be known, before' as 'an inevitable consequence of' something 'universally allowed', 'admitted by all writers on the subject', admitted, therefore, among others, by 'the defenders of the syllogistic theory'. That which is said to be universally admitted is the doctrine 'that a syllogism is vicious if there be anything more in the conclusion than was assumed in the premises', 'that a syllogism can prove no more than is involved in the premises'. The identification and the diagnosis of the doctrine thus formulated may be difficult enough. But three points are indisputable: Mill thinks that the conclusion 'that in every syllogism, considered as an argument to prove the conclusion, there is a *petitio principii*' is required by this doctrine as well as by the doctrine that the assertion of the major premiss is the assertion, among other things, of the conclusion; Mill thinks that the former doctrine is, but that the latter doctrine is not, admitted by 'the defenders of the syllogistic theory'; Mill thinks that the former doctrine directly concerns not the relation of the major premiss, but the relation of the conjunction of the major and the minor, to the conclusion.

Armed with these clues, our difficulty is not that of choosing from a number of doctrines each of which satisfies all three requirements, but rather that of finding even one doctrine which satisfies all three requirements.

Looking to Mill's claim that to allow the doctrine 'is, in fact, to say, that nothing ever was, or can be, proved by syllogism, which was not known, or assumed to be known, before', we are tempted to identify the doctrine under the formula: *The assertion of the conjunction of the major and the minor is the assertion, among other things, of the conclusion.* But, if we do this, we have difficulty in seeing how Mill can claim that the doctrine is 'universally allowed'. For the

doctrine thus formulated is precisely what is in dispute. We should be identifying the 'universally allowed' doctrine with what Mill declares 'an inevitable consequence of the doctrine', and we should be thereby representing Mill as himself guilty of a *petitio principii*. Yet this formulation of the 'universally allowed' doctrine is sanctioned by Mill when he says that 'logicians have persisted in representing the syllogism as a process of inference or proof; though none of them has cleared up the difficulty which arises from the inconsistency between that assertion, and the principle, that if there be anything in the conclusion which was not already asserted in the premises, the argument is vicious'.¹

Looking to Mill's claim that the doctrine is 'universally allowed', we are tempted to identify the doctrine under the formula: *The conjunction of the major and the minor implies the conclusion*. But, if we do this, we have difficulty in seeing how Mill can claim that the relation between premiss and conclusion precludes real inference. For it would have been pretty generally admitted, before the reckless terminological practice of recent logicians produced in the word 'imply' the ambiguity which it professed merely to detect, that the sentence '*p* implies *q*' is, if not synonymous with, at least tantamount to, the sentence '*q* is validly inferable from *p*'. We should, then, be representing Mill as in effect maintaining that validity, is irreconcilable with reality, of inference.

Yet this formulation of the 'universally allowed' doctrine is also sanctioned by Mill, and in terms which show that in sanctioning the first formula he must be speaking loosely. For he proceeds: 'For it is impossible to attach any serious scientific value to such a mere salvo, as the distinction drawn between being involved *by implication* in the premises, and being directly asserted in them.'¹ I take Mill to be here offering, in justification of his momentary identification of the 'universally allowed' doctrine with 'the principle, that if there be anything in the conclusion which was not already asserted in the premises, the argument is vicious', the plea that there

is no 'serious scientific value' in the distinction between ' p implies q ' and 'To assert p is to assert q '—no serious scientific value, that is, in the suggestion that what Mill declares 'an inevitable consequence of the doctrine, admitted by all writers on the subject' is not really an inevitable consequence of the doctrine. And, no doubt, if Mill were right in his interpretation of the distinction, it would lack scientific value: 'When you admitted the major premise, you asserted the conclusion; but, says Archbishop Whately, you asserted it by implication merely' this, however, can here only mean that you asserted it unconsciously; that you did not know you were asserting it'¹

Let us then provisionally identify the 'universally allowed' doctrine under the formula: *The conjunction of the major and the minor implies the conclusion*. I have said that we thereby represent Mill as *in effect* maintaining that validity, is irreconcilable with reality, of inference. But it is not impossible that Mill does *in effect* maintain this, that is, that he maintains *what implies this*. We must, however, be careful to avoid identifying Mill's view with what only follows from it. Accordingly, if we are to identify the 'universally allowed' doctrine under this formula, we are bound to distinguish between ' p implies q ' and ' q is validly inferable from p '. We may provisionally define 'implication' as 'the orthodox *criterion* of validity of inference'. We thus represent the orthodox logician as claiming that q is validly inferable from p if, and only if, p implies q . And we represent Mill as rejecting this claim.

Now concerning induction, which 'is, without doubt, a process of real inference',² Mill says 'The nature and grounds of this inference, and the conditions necessary to make it legitimate, will be the subject of discussion in the Third Book'.² We are bound, therefore, to raise the question 'What is Mill's criterion of validity of inference? What in Mill's system takes the place of implication in the orthodox system?' We must suppose that what seems to the orthodox logician to be the criterion of validity of inference and what seems to Mill to be the criterion of validity of inference, while capable of

¹ p 212² p 187

being confused, yet differ in an important way. The orthodox criterion must be capable of seeming to Mill to be applicable only where to assert p is to assert q . Mill's criterion must be capable of seeming to the orthodox logician to be applicable even where q is not validly inferable from p .

To the question: What is the criterion of validity of inference? the following is at least a plausible answer: q is validly inferable from p if, and only if, it is the case that if p were the case q would be the case. Nobody will deny that this is at least a plausible answer. But some may say that it is a true answer, and some may say that it is only verbally different from the orthodox answer and that 'If p were the case q would be the case' is only a definition of ' p implies q '.

Now even 'If p is the case q is the case', in other words, ' p then q ', has this in common with ' p implies q ': that, if you know either and also know that p , you by inference know that q . But, while it is conceivable that a logician might take logic to be the knowledge of the conditions under which if p were the case q would be the case, it is hardly conceivable that a logician would take logic to be the knowledge of the conditions under which if p is the case q is the case.

'If p is the case q is the case' is true or false according as ' p or q ' is true or false. Its falsity involves the falsity, but its truth by no means involves the truth, of 'If p were the case q would be the case'. The two propositions, however, are apt to be confused, partly because in most situations it would be pointless and misleading to say 'If p then q ' where the more specific 'If p were the case q would be the case' is false, what is pointless and misleading being apt to be confused with what is false. It would be pointless and misleading to say that if the Battle of Hastings was fought in 1067 then the sum of two and three is six. But it would also be pointless and misleading to say that either the Battle of Hastings was not fought in 1067 or the sum of two and three is six. The assertion of either of these composite propositions would be misleading, because it would suggest a connexion between the constituent propositions; and it would suggest a connexion between the

constituent propositions, because in the absence of such a connexion the utterance would be pointless. But the *truth* of both composite propositions is guaranteed by the falsity of the proposition that the Battle of Hastings was fought in 1067. The composite proposition, that if the Battle of Hastings *had been* fought in 1067 then the sum of two and three *would be* six, is, on the other hand, *false*. Here a connexion between the constituent propositions is, not merely suggested, but asserted. The difference may be appreciated by considering the peculiar circumstances in which it would not be pointless and would not be misleading to say 'If p then q ' although 'If p were the case, q would be the case' is false. The example used by Mr. W. E. Johnson in his chapter on 'Compound Propositions' will serve: 'If that boy comes back, I'll eat my hat.' The speaker would not have said: 'If that boy were to come back, I should eat my hat.'

But it is just when the difference between 'If p then q ' and 'If p were the case q would be the case' is appreciated, that the difference between 'If p were the case q would be the case' and ' p implies q ' is most likely to be missed. Both require a connexion between p and q . But the connexion required by ' p implies q ' is more specific than the connexion required by 'If p were the case q would be the case'.

Suppose you know that *Both p and r* implies q and know also that r . Suppose, further, you do not know whether p and that this ignorance prevents you from knowing whether q . Then the discovery that p would enable you by inference to know that q . And, although you would then infer q , not from p , but from *Both p and r* , there is between the two premisses (or conjuncts of the one conjunctive premiss) the important difference that, since you already know that r , you do not need to discover, but only to refrain from forgetting, that r . Knowing that r , but not yet knowing that p , it would be absurd to say: 'If *both p and r* then q '. If you want to put all your cards on the table, you will say: 'If p then q because r .' If you do not want to put all your cards on the table, you will say: 'If p then q .'

A detective may say: 'If the prints on this glass exactly resemble the prints on this revolver, then A is the murderer.' That the two sets of prints resemble one another does not *imply* that anybody committed a murder. If it did, a detective who happened to notice the resemblance, provided that he could reason, would need no further evidence. He would not need even to be told that a murder had been committed. But, when a detective is justified in making such a claim, this is only because he has already gathered and examined other evidence. The fragment which alone he mentions differs from the remainder, not in its superior value as evidence, but in not being discovered until after the remainder. When he says: '*If p then q*', *p* is one of a host of propositions, the conjunctive combination of all of which yields a proposition which implies *q*. But the detective has already satisfied himself of the truth of all except *p*, and so he puts into the antecedent of his hypothetical proposition the only constituent of the conjunctive premiss which has still to be established.

One of the favourite devices for impressing on the reader the intellectual stature of the detective is to represent the detective as saying: '*If p then q*', where *p* is so far from implying *q* that there seems to the reader to be no possible connexion between them. The detective has already done two things, either or both of which the reader has failed to do. The detective has (1) ascertained the truth of several propositions other than *p*, (11) come to see that these other propositions, conjoined with *p*, yield a conjunctive proposition which implies *q*. The more the writer sees to it that the reader does (1) without doing (11), the more the writer deserves to be read.

Now the bare consideration that the other parts of the evidence are known while *p* is still in doubt makes us attach to *p* a value which does not really belong to it. The evidence which turns the scale is viewed as if it were either the whole of the evidence or at least better than the rest. The fact that people have supposed that the question whether America won the War of 1914-18 could be settled merely by finding out whether Germany would have been defeated without America's

contribution, and without finding out whether Germany would have been defeated without Britain's contribution, illustrates the same type of error. But the confusion of '*If p then q* ' with ' *p implies q* ' is further facilitated by the fact that, when we say '*If p then q* ' without adding '*because r* ', our reticence is frequently prompted by our belief that the proposition, that r , is universally admitted. The inductive scientist, for example, proceeds upon premisses which he does not formulate. He packs the antecedents of his hypothetical propositions with empirically verifiable propositions. And not only before verifying them does he say: '*If p then q* ' and even '*If p were the case then q would be the case*'. He also after verifying them says: '*Because p , therefore q* .' And he is justified in doing so. But he would not be justified in saying: ' *p implies q* .'

The practice, where the proposition, that *both p and r* , is complete conclusive evidence for the proposition, that q , and where the proposition, that r , has all along been known to be true and the proposition, that p , alone either is or has been in doubt, of predicating of the proposition, that p , what is strictly predicable only of the proposition, that *both p and r* , is not difficult to understand. Nor is it difficult even to tolerate—outside logic. The logician, however, must never say, where the proposition, that *both p and r* , but nothing less, would be complete conclusive evidence for the proposition, that q ' *q is validly inferable from, depends on, or would follow from, p* '. And he must never in such circumstances say: ' *p implies q* .'

These considerations suggest a possible definition of 'implication'. 'That p is complete conclusive evidence for q ' and 'that *\bar{p} or q* is self-evident' are different ways of saying the same thing. To suggest that the orthodox logician uses 'implication' in such a way that ' *p implies q* ' has the same meaning as ' *\bar{p} or q is self-evident*' would be, perhaps, to pay the orthodox logician an unmerited compliment. But at least we can say that q can be validly inferred from p , if, and only if, *\bar{p} or q* is self-evident. And, if what we want is a definition of 'implication' of such a kind that the formula, '*The conjunction of the major and the minor implies the conclusion*', will fairly

represent the doctrine which Mill thinks both to be 'universally allowed' and to require, though not to be universally allowed to require, *that the assertion of the conjunction of the major and the minor is the assertion among other things of the conclusion*, we have here found what we want.

If we now turn to Mill's disappointingly meagre account of the general nature of real inference, we shall find, amid much that is not clear, justification for ascribing to him not only the view that, where \bar{p} or q is self-evident, q cannot be really inferred from p , but also the view that, where if p were the case q would be the case, q is validly inferable from p .

In § 6 Mill undertakes 'to consider, since the syllogism is not the universal type of the reasoning process, what is the real type' ¹ His treatment of this question is marred by his failure to choose between conflicting views of the extent to which what he takes to be 'the real type' differs from the syllogism, namely, since the difference is not in the conclusion, of the extent to which the premisses of what he takes to be 'the real type' differ from the premisses of the syllogism.

He begins by claiming that his question

'resolves itself into the question, what is the nature of the minor premise, and in what manner it contributes to establish the conclusion for as to the major, we now fully understand, that the place which it nominally occupies in our reasonings, properly belongs to the individual facts or observations of which it expresses the general result, the major itself being no real part of the argument, but an intermediate halting-place for the mind, interposed by an artifice of language between the real premises and the conclusion, by way of a security, which it is in a most material degree, for the correctness of the process' ²

The syllogistic major, then, is 'no real part of the argument'. But, if 'the place which it nominally occupies in our reasonings, properly belongs to the individual facts or observations of which it expresses the general result', ought we to say that the syllogistic major, though it *is not*, yet *corresponds to*, an 'indispensable part of the argument itself', namely, to 'the individual facts or observations of which it expresses the

¹ p. 229.

² pp. 229-30

general result'? If at all, surely not merely on the ground that it 'nominally occupies in our reasonings' this place. For then the correspondence would be only that of *what is mistakenly thought to be* to *what is*. But, if at all, on the ground that it has something in common with 'the individual facts or observations' whose place it 'nominally occupies', something which might be involved in the consideration that it 'expresses the general result' of those facts or observations. Now by proceeding. 'The minor, however, being an indispensable part of the syllogistic expression of an argument, without doubt either is, or corresponds to, an equally indispensable part of the argument itself, and we have only to inquire what part',¹ Mill conveys the impression that he holds, that the syllogistic major not only *is not*, but does not even *correspond to*, an 'indispensable part of the argument itself'. His 'however' seems incapable of being otherwise construed. On the other hand, the reason which he here gives for claiming that the syllogistic minor 'without doubt either is, or corresponds to, an equally indispensable part of the argument itself', namely, that it is 'an indispensable part of the syllogistic expression of an argument', is a reason which could obviously, even on Mill's view, be equally well advanced in support of the same claim in behalf of the syllogistic major. But perhaps Mill has a better reason. And we are left with the legitimate expectation that Mill holds, that the syllogistic minor survives in some respect in which the syllogistic major perishes, that the syllogistic minor is at least more like an 'indispensable part of the argument itself' than is the syllogistic major.

This expectation is not fulfilled. Indeed there occurs in the footnote to § 8 a passage which so clearly rejects any claim of the syllogistic minor to preferential treatment that we should be justified, if only we could be sure that the passage represents Mill's considered view, in disregarding the conflicting suggestion of the opening paragraph of § 6.

'With respect to the minor premise in its formal shape, the minor as it stands in the syllogism, predicating of Socrates a definite class name,

I readily admit that it is no more a necessary part of reasoning than the major. When there is a major, doing its work by means of a class name, minors are needed to interpret it but reasoning can be carried on without either the one or the other. They are not the conditions of reasoning, but a precaution against erroneous reasoning. The only minor premise necessary to reasoning in the example under consideration, is, Socrates is *like* A, B, C, and the other individuals who are known to have died. And this is the only universal type of that step in the reasoning process which is represented by the minor.¹

In this passage Mill not only explicitly co-ordinates the major and the minor. He also gives an account of the proposition 'represented by the minor' of such a kind as to require the co-ordination. For 'the minor as it stands in the syllogism, predicating of Socrates a definite class name' has no better claim to correspondence with the 'only minor premise necessary to reasoning in the example under consideration', namely, the proposition that 'Socrates is *like* A, B, C, and the other individuals who are known to have died', than has the syllogistic major to correspondence with 'the individual facts or observations of which it expresses the general result'.² It is true that Mill's application to the proposition that 'Socrates is *like* A, B, C, and the other individuals who are known to have died', of the description 'the only minor premise necessary to reasoning in the example under consideration' and his distinction of it under this description from 'the minor as it stands in the syllogism' is appropriate to the view that at least a transformed minor survives in real inference. But Mill also applies to the proposition that 'My father, and my father's father, A, B, C, and an indefinite number of other persons, were mortal',³ the description 'the major premise divested of the *petitio principii*, and cut down to as much as is really known by direct evidence'. Whether we say that in real inference the syllogistic premisses are *superseded* or that they are only *transformed*, whether we say that they do or do not correspond to those indispensable parts of the argument whose places they 'nominally occupy', seems, then, to be merely a

¹ p 239, note

³ p 232.

² pp 229-30

matter of taste. The important consideration is that the language appropriate to either syllogistic premiss is equally appropriate to the other.

This passage in the footnote to § 8 does, I think, represent Mill's considered view. But we must remember that it is part of a reply to Mill's critics. And Mill was in the habit, in replying to his critics, of conceding in one form what he nevertheless continued to withhold, however inconsistently, in another form. Unfortunately the passage which ought to be decisive, that in which Mill presents his view of the 'universal type of the reasoning process', is not easily interpreted. I shall consider first his transformed minor premiss and then his transformed major premiss, and in each case I shall consult first the schema offered at the beginning of § 7 and then the illustration offered at the end of § 6.

The schema of Mill's minor premiss is: 'an individual or individuals resemble the former in certain other attributes.'¹ But are these 'other attributes' *specified* in Mill's minor premiss? According to the footnote to § 8, they are not: 'The only minor premiss necessary to reasoning in the example under consideration, is, Socrates is *like* A, B, C, and the other individuals who are known to have died.'² *This* minor premiss does not say in *what* attributes Socrates resembles 'the other individuals who are known to have died'. And the illustration offered at the end of § 6, if we take Mill's language strictly, requires the same interpretation:

'In order to connect this proposition with the conclusion Socrates is mortal, the additional link necessary is such a proposition as the following "Socrates resembles my father, and my father's father, and the other individuals specified" This proposition we assert when we say that Socrates is a man By saying so we likewise assert in what respect he resembles them, namely, in the attributes connoted by the word man.'¹

Here 'the additional link necessary' must be Mill's minor premiss. It is 'such a proposition as the following: "Socrates resembles my father, and my father's father, and the other individuals specified."' And this proposition does not specify

¹ p. 232.

² p. 239.

the attributes in which Socrates resembles the other individuals. Nor can this well be an oversight. For, 'when we say that Socrates is a man', when, that is, we formulate the *sylogistic* minor, we, besides asserting Mill's minor premiss, 'likewise assert in what respect he resembles them, namely, in the attributes connoted by the word man'. The omission, then, of Mill's minor premiss to specify the attributes in which the minor term resembles the others is precisely the difference between Mill's minor premiss and the syllogistic minor premiss.

The schema of Mill's major premiss is: 'Certain individuals have a given attribute.'¹ According to this schema, Mill's major premiss does not say what besides the major term the individuals have in common, and does not say even that they have anything further in common. And, although in the illustration of Mill's major premiss offered at the end of § 6, "'My father, and my father's father, A, B, C, and an indefinite number of other persons, were mortal'",¹ the word 'persons' occurs, the word seems to be introduced only for the sake of abbreviation and not relevantly to differ from, for example, the word 'individuals'. There is nothing to show that, if all the individuals observed to be mortal were enumerated, it would be necessary to incorporate the information that besides being mortal they were men. And Mill's minor premiss presupposes that his major premiss has enumerated all the individuals in question. They are 'individuals specified'.

But perhaps Mill's minor premiss also presupposes that the observed individuals have something besides the being mortal in common. It does so, at least, if we take Mill's meaning to be that 'Socrates resembles my father, and my father's father, and the other individuals specified' in the same attribute and not one in one and others in others. If so, granted that Mill's premisses do not tell us what the middle term is, they do tell us at least that there is a middle term.

Now the question whether Mill's premisses specify the middle term or merely record that there is a middle term is

less important than might be supposed. For, even if the middle term is not specified, provided that it is admitted to be indispensable to record that there is a middle term, it follows that, in concluding that S_1 is P , we rely on the consideration that S_1 is a case of *some* middle term, whatever this may be, and that we rely on nothing else in the nature of S_1 . And, even if we suppose Mill to admit that the middle term is specified and only through carelessness to write as if it were not, the alternative proposition, whose alternants are (i) the contradictory of the conjunction of Mill's major and Mill's minor, (ii) the conclusion, is not self-evident.

Mill admits 'that if this inference can be drawn as to Socrates, it can be drawn as to all others who resemble the observed individuals in the same attributes in which he resembles them; that is (to express the thing concisely) of all mankind' ¹ This, Mill says, 'is certain'. But it is certain only because the inference 'can be drawn as to Socrates' only on the ground that he resembles 'the observed individuals'. Mill, therefore, by implication abandons the claim that we ever reason 'from particulars to particulars without passing through generals'.

More important is Mill's admission that the alternative proposition, whose alternants are (i) the contradictory of the conjunction of his major and his minor, (ii) the conclusion, is not self-evident—that, conformably to the proposed definition of 'implication', the total premiss does not imply the conclusion of Mill's real inference. We must now see what form this admission takes and by what device Mill tries to reconcile validity, with reality, of inference:

'This type of ratiocination does not claim, like the syllogism, to be conclusive from the mere form of the expression, nor can it possibly be so. That one proposition does or does not assert the very fact which was already asserted in another, may appear from the form of the expression, that is, from a comparison of the language, but when the two propositions assert facts which are *bond fide* different, whether the one fact proves the other or not can never appear from the language, but must depend on other considerations.'²

¹ p 233

² pp 232-3

Mill here once more identifies the 'universally allowed' doctrine with what he considers 'an inevitable consequence of the doctrine'. It must be protested that, where \bar{p} or q is self-evident, ' q ' does *not* 'assert the very fact which was already asserted in' ' \bar{p} '; that the conclusiveness of the inference ' \bar{p} , therefore q ' does *not* 'appear from the form of the expression, that is, from a comparison of the language'; that the two propositions *do* assert 'facts which are *bonâ fide* different'. But, granted accordingly that 'whether the one fact proves the other or not can never appear from the language, but must depend on other considerations', the only other consideration admissible, where we are inquiring whether q is validly inferable from p , is the consideration whether \bar{p} or q is self-evident. If \bar{p} or q is not self-evident then, while other considerations may show that \bar{p} or q , they cannot show that p 'proves' q , that 'it is allowable to infer' q from p . If other considerations, r , reveal that \bar{p} or q , then nothing less than the proposition, that *both* p and r , proves q and it is allowable to infer q from nothing less. Moreover, the proposition, that \bar{r} or \bar{p} or q , must then be self-evident.

But the 'other considerations' which Mill has in mind are clearly not the consideration whether \bar{p} or q is self-evident. What are they?

'Whether, from the attributes in which Socrates resembles those men who have heretofore died, it is allowable to infer that he resembles them also in being mortal, is a question of Induction, and is to be decided by the principles or canons which we shall hereafter recognise as tests of the correct performance of that great mental operation'¹

Now 'from the attributes in which Socrates resembles those men who have heretofore died' it is certainly *not* 'allowable to infer that he resembles them also in being mortal'. From the conjunctive proposition, whose conjuncts are (i) that Socrates resembles those men who have heretofore died, in being a man, (ii) that all men are mortal (and for (i) we may substitute: that Socrates is a man), it *is* allowable to infer that

Socrates is mortal. But this is a question of *deduction*. The only remaining question is whether all men are mortal. And it is this question which Mill represents as the question 'whether, from the attributes in which Socrates resembles those men who have heretofore died, it is allowable to infer that he resembles them also in being mortal'. And this question cannot be decided by purely logical considerations. It may be 'a question of Induction' in the sense that it is by induction that the answer must be found; but it is not a question *about* induction. It may be decided by inquiry *in accordance with* 'the principles or canons' of induction; but not by merely consulting those principles or canons. What is needed is further evidence, not a superior capacity for handling the only evidence which Mill's premiss comprises.

Now this suggestion, that the 'other considerations', on which the validity of Mill's real inference depends, are *principles*, and not *premisses*, of inference, is well devised to confound the objection that inference, if it is to satisfy Mill's criterion of reality, must be invalid. For principles of inference are rightly distinguished from premisses; we are rightly said to infer not *from* them, but *according to* them. The orthodox objection that the suppression or radical transformation of the syllogistic major issues, at best, in enthymeme would be met, if it could be shown that the syllogistic major, granted that you must command it if you are to be able validly to infer the conclusion, is not a premiss, but is the principle, of the inference.

What propositions 'the principles or canons' are, Mill does not here tell us. But in Book III Mill says that 'every induction may be thrown into the form of a syllogism, by supplying a major premise',¹ and that if this be done the principle

'of the uniformity of the course of nature, will appear as the ultimate major premise of all inductions, and will, therefore, stand to all inductions in the relation in which, as has been shown at so much length, the major proposition of a syllogism always stands to the conclusion; not contributing at all to prove it, but being a necessary condition of its being proved;

since no conclusion is proved, for which there cannot be found a true major premise '

And Mill's whole treatment of induction in Book III rests on this presupposition that what Book II has shown is, that the syllogistic major, while not a premiss, is a principle, of real inference.

In his accounts, in §§ 2-4 and in § 5, of the nature of the syllogism Mill seems not even to try to establish the positive contention in this thesis. He does at least try to establish it in his third account, in § 8.

CHAPTER XII

THIRD ACCOUNT OF SYLLOGISM

IN defining, in § 8,¹ his attitude toward what he considers the 'principal objection'² of those who reject the 'theory of the syllogism laid down in the preceding pages', Mill grounds his already familiar protest 'against the doctrine that the syllogistic art is useless for the purposes of reasoning'³ on an interpretation of the syllogistic major premiss which seems an abandonment of his claim that 'a general truth is but an aggregate of particular truths'.⁴

'Their principal objection cannot be better or more succinctly stated than by borrowing a sentence from Archbishop Whately "In every case where an inference is drawn from Induction (unless that name is to be given to a mere random guess without any grounds at all) we must form a judgment that the instance or instances adduced are *sufficient* to authorize the conclusion; that it is *allowable* to take these instances as a sample warranting an inference respecting the whole class," and the expression of this judgment in words (it has been said by several of my critics) is the major premise'⁵

This had been said by Whately, who introduces the sentence quoted by Mill as something which 'is evident, and is universally admitted',⁶ and adds: 'Now the expression of this judgment in words, is *the very Major-premiss* alluded to' Mill proceeds:

'I quite admit that the major is an affirmation of the sufficiency of the evidence on which the conclusion rests That it is so, is the very essence

¹ § 8 made its first appearance in the fifth edition. But most of what Mill there says in reply to Whately he had already said in reply to 'a writer in the "British Quarterly Review"'. This writer, in an article whose ability Mill seriously underestimates, reviewed in 1846 the second edition of Mill's *System of Logic*. Mill replied in a 'Note Supplementary to the Preceding Chapter', introduced into the third edition. In the fourth edition this Note was enlarged. In the fifth edition two paragraphs are built into the new § 8, one paragraph appears as a footnote to § 5, and an unsuccessful attempt to take up the reviewer's challenge to exhibit the *petitio principii* in *Camestres* is suppressed.

² p 234

⁴ p 213

³ p 225

⁵ pp 234-5.

⁶ *Elements of Logic*, 8th ed., p 234

of my own theory And whoever admits that the major premise is *only* this, adopts the theory in its essentials'¹

The admission may be 'the very essence of' that theory of the syllogism which Mill now proceeds to advocate It is so far from being 'the very essence of', that it is irreconcilable with, any theory of the syllogism 'laid down in the preceding pages'.

There is, in the first place, a conflict between Mill's admission 'that the major is an affirmation of the sufficiency of the evidence on which the conclusion rests', a conflict only sharpened if we pin Mill down to the admission 'that the major premise is *only* this', and his earlier identification of the major premiss with the conclusion of an inference to generals, resting on the same evidence as, being indeed the conjunction of, the conclusions of a number of inferences to particulars, evidence which 'is either sufficient in itself, or, if insufficient for the one purpose, cannot be sufficient for the other'.² We have already seen reason to interpret this identification as exhaustive of only a selection from that 'aggregate of particular truths'³ with which Mill begins by identifying the major premiss, the selection, namely, there described as 'all that we infer from our observations'. To affirm this selection, at least, is not to affirm, though it may involve readiness to affirm, 'the sufficiency of the evidence on which the conclusion rests'.¹ Can we, then, find 'an affirmation of the sufficiency of the evidence on which the conclusion rests' in the affirmation of the remainder of that 'aggregate of particular truths' with which Mill begins by identifying the major premiss, the selection, namely, there described as 'all that we have observed'?³ Even more obviously not. For *this* selection is precisely what Mill has called 'the major premise divested of the *petitio principii*, and cut down to as much as is really known by direct evidence'.⁴ *This* selection is the major premiss of Mill's own real inference as distinguished from the syllogistic major. To affirm *this* selection would be, as Mill requires us

¹ p. 235.

³ p. 213.

² p. 214

⁴ p. 232.

in affirming the premiss of an induction to do, to affirm 'the evidence itself' and not 'the sufficiency of the evidence'.¹ There seems, then, to be no possibility of reconciling the admission 'that the major is an affirmation of the sufficiency of the evidence on which the conclusion rests', not even the admission that the major is among other things this, with the claim that 'a general truth is but an aggregate of particular truths'.²

Of the two alternative hypotheses thus seen to be incapable of resolving the conflict, one may yet prove capable of at least explaining Mill's failure to detect the conflict. The more promising hypothesis is that Mill here, as certainly elsewhere, loosely identifies the syllogistic major with that selection (from the 'aggregate of particular truths' with which he begins by identifying it) described as 'all that we infer from our observations'. Our problem, on this hypothesis, is to see how Mill could mistake an affirmation of 'the whole of what our evidence must prove if it proves anything'³ for 'an affirmation of the sufficiency of the evidence'⁴ to prove any part of this whole.

By 'an affirmation of the sufficiency of the evidence on which the conclusion rests' either of two types of proposition might be intended. A proposition of the form '*p* is sufficient evidence of *q*' might be so described. But so also might a proposition of the form '*q* is sufficiently evidenced', differing from the former in not saying what the evidence is. And there is a further complication. You may say '*p* is sufficient evidence of *q*', although you think that only *Both p and r* is sufficient evidence of *q*, provided that you know that *r*. You may loosely describe as 'sufficient evidence' a fact whose addition to facts already ascertained would yield a sum which would be strictly described as 'sufficient evidence'. Where, on the other hand, you say '*q* is sufficiently evidenced', the omission to say what the evidence is makes the distinction between the loose and the strict use of 'sufficient evidence'

¹ pp. 235-6
² p. 225

³ p. 213
⁴ p. 235.

irrelevant. For, although what would be loosely described as 'sufficient evidence' may be very different from what would be strictly described as 'sufficient evidence', there can nevertheless be what would be loosely described as 'sufficient evidence' only if there is also what would be strictly described as 'sufficient evidence'.

If by saying 'that the major is an affirmation of the sufficiency of the evidence on which the conclusion rests' Mill were claiming that the major is of the form ' p is sufficient evidence of q ', then for the view that the major is an aggregate of particulars, one selection from which is 'all that we have observed' and the remainder of which is 'all that we infer from our observations', he might seem to be substituting the view that the major affirms that the former selection is sufficient evidence of the latter. But perhaps it would be better to enforce Mill's denial, in the footnote to § 8, that the major premiss 'individually specifies all it includes'¹ and his admission that 'the only indication it gives is a description by marks'. For 'all that we have observed' may be forgotten, and not 'all that we infer from our observations' may be yet available. If so, the major premiss, being of the form ' p is sufficient evidence of q ', would have to be more specifically of the form 'Being M is sufficient evidence of being P ', for example, 'Being a man is sufficient evidence of being mortal'.

Passages in which Mill seems to adopt this view have already been before us. Viewed as a memorandum for practical use, 'the proposition, All men are mortal, means that the attributes of man are *evidence of*, are a *mark of*, mortality'.² That version of 'the axioms on which the syllogistic process is founded',³ which treats M as 'a mark or evidence of' P is 'better adapted than any I am acquainted with, to express with precision and force what is aimed at, and actually accomplished, in every case of the ascertainment of a truth by ratiocination'.⁴ 'If, therefore, the argument be admissible in the case of Socrates, we are at liberty, once for all, to treat the possession of the

¹ p. 238³ p. 206.² p. 131⁴ p. 207.

attributes of man as a mark, or satisfactory evidence, of the attribute of mortality'¹

In all such passages Mill loosely describes as 'evidence' what I think that his considered view requires to be only a part of what would be strictly described as 'evidence'. Support for this interpretation seems to me to be provided by another passage, in which Mill uses loose language of the same kind although the whole aim of the passage is to refute the very doctrine which this language, taken strictly, would require.

The passage is that in which Mill, preparing the way for his own transformation of the syllogistic premisses, notices 'a speculation of a philosopher to whom mental science is much indebted, but who, though a very penetrating, was a very hasty thinker, and whose want of due circumspection rendered him fully as remarkable for what he did not see, as for what he saw'² Dr. Thomas Brown 'thought it incumbent on him to strike out the major altogether from the reasoning process, without substituting anything else, and maintained that our reasonings consist only of the minor premise and the conclusion, Socrates is a man, therefore Socrates is mortal: thus actually suppressing, as an unnecessary step in the argument, the appeal to former experience'. Now this is exactly what the contention, that the syllogistic major is of the form 'Being M is sufficient evidence of being P', would, taken strictly, require. If being a man were sufficient evidence of being mortal, then the conclusion, that Socrates is mortal, would be validly inferable from the minor premiss, that Socrates is a man

Instead of concentrating on the task of refuting this position, that the conclusion is validly inferable from the syllo-

¹ p. 233

² p. 230 Welsh's memoir is more flattering 'That Dr. Brown preferred poetry to philosophy, is certain. The rapidity with which he arrived at the knowledge of the questions that have been discussed among philosophers, made him feel it as an irksome task to dwell upon those intermediate steps which were necessary for the satisfaction of other minds, though, to his quicker glance, the conclusion seemed intuitively obvious' (Brown *Lectures on the Philosophy of the Human Mind*, 13th ed., p. xvi.)

gistic minor, Mill, on the scarcely plausible pretext that the absurdity of this position was disguised from Brown by a certain other opinion, yields to the temptation of contenting himself with showing that the position is inconsistent with this other opinion:

‘The absurdity of this was disguised from him by the opinion he adopted, that reasoning is merely analysing our own general notions, or abstract ideas, and that the proposition, Socrates is mortal, is evolved from the proposition, Socrates is a man, simply by recognising the notion of mortality as already contained in the notion we form of a man. After the explanations so fully entered into on the subject of propositions, much further discussion cannot be necessary to make the radical error of this view of ratiocination apparent. If the word man connoted mortality; if the meaning of “mortal” were involved in the meaning of “man,” we might, undoubtedly, evolve the conclusion from the minor alone, because the minor would have already asserted it. But if, as is in fact the case, the word man does not connote mortality, how does it appear that in the mind of every person who admits Socrates to be a man, the idea of man must include the idea of mortality?’¹

But it seems clear that the other opinion ascribed to Brown, so far from disguising, could only intensify, the absurdity of the position, that the conclusion is validly inferable from the syllogistic minor. This position is rendered not more, but less, plausible by being associated with the opinion that the assertion of the premiss of a valid inference must be the assertion at least among other things of the conclusion. The unfortunate consequence of Mill’s digression is this. All that he has accomplished is a refutation, or rather a justifiable rejection, of the position that the assertion of the syllogistic minor is the assertion of the conclusion, the position that the syllogistic major is not indispensable even to merely apparent inference. Mill thus censures the position, that the conclusion is validly inferable from the syllogistic minor, for *being* exactly what he has censured the orthodox position for *not being*, namely, a doctrine of real, rather than of merely apparent, inference.

What Mill ought to do is to confine himself to a careful

¹ pp. 230-1.

elaboration of his objection that the position, that the conclusion is validly inferable from the syllogistic minor, involves 'suppressing, as an unnecessary step in the argument, the appeal to former experience'.¹ But it is just in his incidental elaboration of this objection that Mill permits himself to use language which, taken strictly, would require the acceptance of the position under attack:

'Dr Brown could not help seeing this difficulty, and in order to avoid it, was led, contrary to his intention, to re-establish, under another name, that step in the argument which corresponds to the major, by affirming the necessity of *previously perceiving* the relation between the idea of man and the idea of mortal. If the reasoner has not previously perceived this relation, he will not, says Dr Brown, infer because Socrates is a man, that Socrates is mortal. But even this admission, though amounting to a surrender of the doctrine that an argument consists of the minor and the conclusion alone, will not save the remainder of Dr Brown's theory. The failure of assent to the argument does not take place merely because the reasoner, for want of due analysis, does not perceive that his idea of man includes the idea of mortality, it takes place, much more commonly, because in his mind that relation between the two ideas has never existed. And in truth it never does exist, except as the result of experience'.²

But to admit that, even though only 'as the result of experience', we can 'assent to the argument' is to admit that experience enables us, dispensing with experience, to recognize that being a man is sufficient evidence of being mortal. Mill fails to insist on the *respect* in which experience must be held indispensable. Instead of language appropriate to the position that 'the appeal to former experience' is indispensable, that experience is an indispensable part of the evidence, Mill uses, in the very process of defending this position, language appropriate to its surrender in favour of the position that experience is an indispensable condition only of the capacity to grasp evidence of which it is not a part.

From the same passage may be gathered another important clue to that theory of the syllogism adopted in § 8:

¹ p. 230.

² p. 231.

'He saw the *petitio principii* which is inherent in every syllogism, if we consider the major to be itself the evidence by which the conclusion is proved, instead of being, what in fact it is, an assertion of the existence of evidence sufficient to prove any conclusion of a given description'¹

In saying this, Mill is of course unmistakably himself admitting that the major is 'an assertion of the existence of evidence sufficient to prove any conclusion of a given description'. At the same time, Mill is failing to see that, not this view of the major, but the view that the major further tells us what the evidence is, is appropriate to the doctrine that the conclusion is validly inferable from the syllogistic minor. The view that the major is merely 'an assertion of the existence of evidence sufficient to prove any conclusion of a given description', here both ascribed to Brown and acknowledged by Mill, is, on the other hand, non-committal. The sufficient evidence might or might not be exhausted by the syllogistic minor. The question, whether we ought, with Brown, 'to strike out the major altogether from the reasoning process, without substituting anything else', or, with Mill, to substitute for the syllogistic major 'the major premise divested of the *petitio principii*, and cut down to as much as is really known by direct evidence',² would be left open. At the same time, Mill's rejection of the doctrine, that the conclusion is validly inferable from the syllogistic minor, requires his rejection of the view of the major which is appropriate to the doctrine

We are, then, I think, justified in concluding that, while Mill certainly altogether fails to appreciate the importance of distinguishing between the two views, his own view is rather that the major is of the form '*q* is sufficiently evidenced', for example, 'There is sufficient evidence for all propositions affirming mortality of any man', than that the major is of the form '*p* is sufficient evidence of *q*', for example, 'Being a man is sufficient evidence of being mortal'. I propose, accordingly, to interpret Mill's admission 'that the major is an affirmation of the sufficiency of the evidence on which the conclusion

¹ p 230.² p 232

rests'¹ as nothing but an ambiguous version of what he has himself put unambiguously by saying that the major is 'an assertion of the existence of evidence sufficient to prove any conclusion of a given description'.²

Let us, therefore, begin by examining the unambiguous formula. Although unambiguous, it is by no means incapable of being misunderstood. We might be tempted to interpret Mill's acceptance of the formula as a deliberate surrender of the claim that 'a general truth is but an aggregate of particular truths'.³ But, (1) had Mill offered instead of the formula the following: 'an assertion of the existence of evidence sufficient to prove *every* conclusion (or *all* conclusions) of a given description', he clearly would not have been deliberately surrendering the claim that 'a general truth is but an aggregate of particular truths'. For the question, whether the proposition, that all conclusions of a given description are sufficiently evidenced, is an aggregate of particulars, is only a special case of the question, whether a general proposition is an aggregate of particulars. An affirmative answer to the former is not less plausible than an affirmative answer to the latter. (2) Granted that what Mill says is neither 'every' nor 'all' but 'any', the difference is not in the least indicative of a disposition to surrender the claim in question. For Mill has already expressed the opinion that, 'if the general propositions employed in reasoning, instead of being in the form All men are mortal, or Every man is mortal, were expressed in the form Any man is mortal', the mode of expression 'would much better manifest the true idea—that inductive reasoning is always, at bottom, inference from particulars to particulars'.⁴ Accordingly, the

¹ p 235

² p 230

³ p 213

⁴ p 228, note. This note appeared in the fourth edition as the last paragraph of the 'Note Supplementary to the Preceding Chapter'. Mill's view of the effect of substituting 'any' for 'all' or 'every' is curious. The form '*Any S is P*' is among those which Dr. Keynes thinks would, better than the form '*All S is P*', bring out the 'true character and value' of a major which is 'unconditionally universal, expressing a general law dependent on qualitative relations' (*Formal Logic*, 4th ed., p 427). This view is at least as plausible as Mill's. But it is desirable that the difference between '*every*' and '*any*' should be made a subject of systematic study.

fact that Mill says neither 'every' nor 'all' but 'any' is not indicative of even momentary forgetfulness of his claim that 'a general truth is but an aggregate of particular truths'.

Mill's acceptance of this formula is nevertheless inconsistent. No doubt, 'any conclusion of a given description' may be a member of an aggregate of particulars, the aggregate of the conclusions of the given description. But it is one thing to say that the major premiss *is* this aggregate. It is another thing to say that the major premiss *is about* this aggregate, even if, consistently with this, it can *be* another aggregate. If Mill were asked of what nature he supposes the 'given description' to be, he might answer by substituting in his formula: 'any conclusion whose predicate is P and whose subject is an M'. For example, the proposition, that all men are mortal, would be an assertion of the existence of evidence sufficient to prove any conclusion whose predicate is mortality and whose subject is a man. But the only aggregate of particulars with which the proposition, that all men are mortal, can be at all plausibly identified is the aggregate of the propositions which answer to this description: propositions such as 'Socrates is mortal'. Consistently, then, with the only plausible identification, 'an assertion of the existence of evidence sufficient to prove any conclusion of a given description' would be, not the major, but an assertion of the existence of evidence sufficient to prove the major.

To identify, in general, the assertion of a proposition with the assertion of the existence of evidence sufficient to prove that proposition, would be doubly inaccurate (1) Granted that the assertion of a proposition commits you to the assertion that the proposition is evidenced, a proposition may be sufficiently evidenced although there is no evidence whatever to *prove* it. For a proposition may be self-evident. Accordingly, the assertion of a proposition need not even *commit* you to the assertion that there exists evidence sufficient to *prove* it. Of this inaccuracy, however, Mill must here be acquitted. The propositions in question are *ex hypothesi* not self-evident. Let us grant, then, that the assertion of the propositions in

question does at least *commit* you to the assertion of the existence of evidence sufficient to prove them. (2) But, granted that the assertion of a proposition always *commits* you to the assertion that the proposition is sufficiently evidenced, and granted that the assertion of the propositions in question *commits* you to the assertion of the existence of evidence sufficient to prove them, the assertion of a proposition never *is* the assertion that the proposition is sufficiently evidenced

Why does the assertion of a proposition commit the speaker to the assertion that the proposition is sufficiently evidenced? Because it commits him to the assertion that he accepts the proposition. But why to this? A speaker, if he speaks intelligently, anticipates the situation of the hearer. The hearer has before him a particular sound, which he recognizes as an instance of a proposition whose meaning he already knows (or, already knowing the meanings of the several words, is at least capable of construing). The hearer will thus entertain a possible fact. But this is by no means all. The hearer also knows that this particular sound was made by the speaker, presumably for a purpose. The obvious purpose is to lead the hearer to accept the proposition. Now, (1) unless the speaker is out to deceive the hearer, he must himself accept the proposition which he intends the hearer to accept; and (11) even if the speaker is out to deceive the hearer, not himself accepting the proposition, he must still be ready to *assert* his acceptance of the proposition. For the rest, the question is only whether you can properly accept a proposition without grasping sufficient evidence for it.

The difference between the two lines of thought, which are open to the hearer, may be brought out by contrasting a situation in which only one of them is open. Suppose I come upon a group of pebbles arranged, but fortuitously, in the form of a written sentence. The presentation will, as before, lead me to the proposition (with its meaning) which would be so written. I shall entertain a possible fact. I may even wonder whether it is a fact. But I shall not suppose, from

seeing the group of pebbles, that anybody accepts the proposition

When you say anything, you must expect people to recognize not only *what you say*, but also *that you say it*. How else could you make them recognize this? Not by saying 'I say that *p*' instead of saying merely '*p*'. For how are they to recognize who says 'I say that *p*'? Only by recognizing that you say 'I say that *p*' in the same way as that in which they would recognize that you say '*p*', can they recognize to whom the pronoun 'I' refers. Even to say 'P N. says that *p*', where 'P.N.' is a unique proper name, would not meet the need. For somebody else might say this; or it might be even fortuitously produced. There is no evidence that you say '*p*' until some speaker is held responsible not merely for *what he says* but also for *his saying it*.

Let us grant, then, further that it is, for many purposes, unimportant to distinguish between the assertion of the propositions in question and the assertion of the existence of evidence sufficient to prove them. We still cannot grant that the logician's diagnosis of inference is among the many purposes for which the distinction is unimportant. On the contrary, the knowledge of the answer to the question, whether the syllogistic major is, or is not, a genuine premiss, may well depend upon the most scrupulous enforcement of the distinction. Nor could Mill profit by the extreme concession that the distinction is irrelevant. For it is on the relevance of this very distinction that he is himself insisting. He rests his case, in § 8, against the view that the syllogistic major is a genuine premiss, on the ground that to affirm the syllogistic major is to affirm, not the evidence itself, but the sufficiency of the evidence:

'But I cannot concede that this recognition of the sufficiency of the evidence—that is, of the correctness of the induction—is a part of the induction itself; unless we ought to say that it is a part of everything we do, to satisfy ourselves that it has been done rightly.'¹

'The conclusion in an induction is inferred from the evidence itself,

and not from a recognition of the sufficiency of the evidence, as I infer that my friend is walking towards me because I see him, and not because I recognise that my eyes are open, and that eyesight is a means of knowledge "1

And, whatever we may think of Mill's illustration, his claim, that the conclusion is inferred from the evidence itself and not from the proposition that the evidence is sufficient, is true, unless indeed it is tautological. Where p is strictly sufficient evidence of q , q is inferred from p , and not from either q *is sufficiently evidenced* or p *is sufficient evidence of* q . Moreover, while Mill is wrong in his refusal to concede that the recognition that p is sufficient evidence of q , which of course involves the recognition that q is sufficiently evidenced, is 'a part of the induction itself', Whately needs to be told that such recognition must be distinguished from the affirmation of a premiss.

Mill is wrong in his refusal to concede that the recognition that the premiss is sufficient evidence of the conclusion 'is a part of the induction itself'. We are justified here in cutting short any dispute about the meaning of the word 'induction'. For Whately stipulates: 'unless that name is to be given to a mere random guess without any grounds at all', that is, I take it, without any *recognition* of grounds. So far as Mill thinks that it is sufficient for him to establish the possibility of passing from p to q , of believing q under the influence of a belief in p , without recognizing that p is sufficient evidence of q , he is guilty of an *ignoratio elenchi*. And part of what he here says is appropriate only if Mill does think this:

'We conclude from known instances to unknown by the impulse of the generalizing propensity, and (until after a considerable amount of practice and mental discipline) the question of the sufficiency of the evidence is only raised by a retrospective act, turning back upon our own footsteps, and examining whether we were warranted in doing what we have provisionally done. To speak of this reflex operation as part of the original one, requiring to be expressed in words in order that the verbal formula may correctly represent the psychological process, appears to me false psychology. We review our syllogistic as well as our inductive processes, and recognise that they have been correctly per-

formed, but logicians do not add a third premise to the syllogism, to express this act of recognition. A careful copyist verifies his transcript by collating it with the original, and if no error appears, he recognises that the transcript has been correctly made. But we do not call the examination of the copy a part of the act of copying.¹

It is necessary, however, to avoid not only false psychology but also false epistemology. We must recognize not only what psychological processes are possible but also what psychological processes are inductions. If Mill's 'original' operation is 'a mere random guess' (however fortunate), its nature is beside the point. If Mill does not admit that his 'original' operation is 'a mere random guess', he ought to show how, without including the recognition that p is sufficient evidence of q , it can be more. A mere comparison with other successful operations, such as faithful copying, does not elicit the peculiar nature of the operation in dispute.

Almost certainly, however, Mill would not admit the operation, which he undertakes to delineate, to be 'a mere random guess'. On the contrary, I think that the *respect* in which he compares it with other successful operations is evidence that he *does* try to show that, in order to be more than 'a mere random guess', in order to be *inference*, it need not include the recognition that p is sufficient evidence of q . But he confuses this recognition with something which nothing in the world could include, something, therefore, in its exclusion of which, inference can fairly be compared with other operations.

We must concede to Mill that 'we do not call the examination of the copy a part of the act of copying'. We must associate ourselves with his denial that 'we ought to say that it is a part of everything we do, to satisfy ourselves that it has been done rightly'. But we must go further. It is a part of *nothing* we do, 'to satisfy ourselves that it has been done rightly'. Inference may be as different as you please from copying. But they do agree at least in this. Not only is Mill right in holding that we need not, he is wrong in holding that we ever can, 'make the testing operation a part of the reasoning process

itself',¹ namely, that reasoning process which is being tested. Ought we, then, to say, not only as Mill does of some, but of all, inferences: 'But though he may conclude rightly, he never, properly speaking, knows whether he has done so or not'?¹ Of all inferences, if 'know' indicates a *state*. Of none, which are cases of knowing, if 'know' indicates a *disposition*.

The problem thus raised is that of the relation of *knowing* to *knowing that you know*. This problem is apt to appear insoluble. On the one hand, there is a temptation to view knowing as an exception to the rule that 'to satisfy ourselves that it has been done rightly' is a part of nothing we do. There is a temptation to claim that, unless you *know that you know*, you do not *know*, but only *believe*. For, if you only *think* that you know, that is, only *believe* that you know, you do not know. On the other hand, this claim is easily seen to threaten us with the absurdity that every state of knowing must be accompanied by an infinite number of other states of knowing.

In order to solve the problem, it is necessary in the first place to recognize that believing a proposition and doubting it are not the sole alternatives to knowing it (or its contradictory). You may not entertain the proposition. Now it is partly because, if they say that you can know *without knowing that you know*, they are mistakenly thought to be admitting that you can know *while either merely believing that, or doubting whether, you know*, that people are driven into saying that you can know *only if you know that you know*.

Not only may people thus feel compelled to say, however unwillingly, that you can know only if you know that you know. There is, in the second place, a thoroughly well-established sense of the word 'know', in which this is truly said, the sense, namely, in which not a mental *state* but the correlative *disposition* is indicated. To know a proposition, in this derivative sense, is to be such that you would, if you entertained the proposition, know the proposition in the fundamental sense. Now it is true that knowing, in the fundamental sense (and, therefore, also in the derivative sense),

¹ p. 236.

involves knowing, in the derivative sense, that you know. As before, an infinite process is generated. But the infinite process is this time unobjectionable. If I know a proposition, then if I asked myself whether I knew the proposition, I should know that I knew it, and if I asked myself (as I never should) whether I knew that I knew the proposition, I should know that I knew that I knew it. *Ad infinitum*. But why not? *Ad infinitum*, moreover, only provided that the requisite propositions are capable of being entertained. But is it certain that they can be entertained beyond a very moderate degree of complexity?

Such inference as is knowledge must conform to this account. You can be in the state of knowing q by inference from p without being in the state of knowing either that you are in this state or that you have the correlative disposition; but not without being such that you would know both these things if you raised the questions to which they are the answers.

But concluding, even rightly, need not be knowing. Concluding q from p involves believing that both p and p is *sufficient evidence of* q . *Rightly* concluding q from p involves *truly* believing that both p and p is *sufficient evidence of* q .

Now you can be in *this* state without being such that you would, if you raised the question, know that you were. For knowing that you truly believed something involves knowing what you truly believed. But the effect of raising, on an occasion on which you truly believe something, the question whether you truly believe it, may be to make you doubt what you truly believed, and so to make you doubt whether you truly believed.

What we have here to consider, however, is a case where you *do* come to know that you concluded rightly. And, supposing that your concluding was not knowing, this involves a transition from truly believing, to knowing, that both p and p is *sufficient evidence of* q .

The transition may be, in a *posteriori* reasoning *must* be, very different in respect of the two conjuncts. The transition

from believing to knowing p may be the finding evidence for p which you previously lacked. But there can be no finding evidence for the proposition, that p is sufficient evidence of q , the proposition, in other words, that \bar{p} or q is self-evident. The only way of coming to know, where you previously merely truly believed, that p is sufficient evidence of q , is fully to grasp precisely that question which you previously answered without fully grasping it. So far, then, as *this* conjunct is concerned (and it is the one with which Mill ought to be concerned), what you need to do is not to *test your reasoning* but to *do it again*.

Replying to an objection brought by Whewell against his use of the word 'Induction', Mill says:

'I disclaim, as strongly as Dr Whewell can do, the application of such terms as induction, inference, or reasoning, to operations performed by mere instinct, that is, from an animal impulse, without the exertion of any intelligence. But I perceive no grounds for confining the use of those terms to cases in which the inference is drawn in the forms and with the precautions required by scientific propriety.'¹

Granted that Mill sometimes introduces what, according to this disclaimer, is beside the point, I do not think that we need be forced to explain in this way the principal thesis of § 8. Mill admits that one who concludes rightly, but to particulars without passing through generals, 'never, properly speaking, knows whether he has done so or not'.² It follows, if 'know' is used in the dispositional sense, that his concluding is not knowing. And I think that Mill would admit that this follows. He would say, and so far justly, that inference, even correct inference, need not be knowledge, but that the alternative is not 'a mere random guess without any grounds at all'. This is not the sole alternative. But what the remaining alternatives are Mill does not with sufficient care consider.

Granted that Mill is justified in using the word 'Induction' (conformably to Whately's stipulation) to cover belief as distinguished from knowledge, and granted that Mill is justified in using the adjectives 'correct' and 'right' to cover true

¹ p. 331, note.

² p. 236.

belief as distinguished from knowledge, he would certainly not be justified in using the word 'Induction' to cover just any belief, nor even to cover just any belief conditioned in just any way by other belief. What then is the peculiarity of such belief as is induction or, perhaps more generally, inference? The peculiarity lies solely in what is believed. To infer q from p , whether correctly or incorrectly, you must, if you do not know, at least believe, that both p and p is *sufficient evidence of q* .

Only Mill's failure to see this can account for his doctrine that you can infer from particulars to particulars without passing through generals, recognizing only that p and that q while failing to recognize that p is *sufficient evidence of q* . And, in saying, in explanation of the admission that 'he never, properly speaking, knows whether he has done so or not' (and so does not know the conclusion of his inference), that 'he has not tested his reasoning', Mill thinks of the question, whether the premiss is sufficient evidence of the conclusion, as still having to be raised, not as having only to be reconsidered. But if the question has not already been raised there has been no *concluding*. We can grant Mill that concluding, even rightly, does not require *knowing* that the premiss is sufficient evidence of the conclusion. We must insist that concluding, even wrongly, does require, if not *knowing*, at least *believing*, that the premiss is sufficient evidence of the conclusion. Now what Whately says in the sentence quoted by Mill is that 'we must form a judgment that the instance or instances adduced are *sufficient* to authorize the conclusion'. What Mill calls 'this recognition of the sufficiency of the evidence' should, therefore, be the *judgement* that the evidence is sufficient, whether knowledge or belief. If so, Mill's claim that 'this recognition of the sufficiency of the evidence—that is, of the correctness of the induction' is not 'a part of the induction itself' must be rejected.

This claim, however, is a claim of which Mill really stands in no need. The claim of which he stands in need is the claim that, granted that the recognition of the sufficiency of the

evidence *is* a part of the inference, the recognition of the sufficiency of the evidence is still not the affirmation of a premiss. It is necessary only to insist, as Mill rightly insists, on the difference between asserting *the sufficiency of the evidence* and asserting *the evidence itself*, in order to see that, if only the major *were* 'an affirmation of the sufficiency of the evidence on which the conclusion rests', the major would not be a genuine premiss, and the main point at issue between Mill and his critics would thus be decided in Mill's favour. But the major is not 'an affirmation of the sufficiency of the evidence on which the conclusion rests'. And Mill's claim, that it is, rests on nothing better than the failure to draw that very distinction between *the evidence* and *the sufficiency of the evidence* which he later proceeds to enforce.

It may be said, however, that Mill does not so much *claim*, as *admit*, that the major is 'an affirmation of the sufficiency of the evidence on which the conclusion rests'. Mill has, it may be said, at least an *argumentum ad hominem*, perhaps even *ad homines*, against his critics. It is worth while, therefore, to inquire how Whately could have come to demand what Mill can so joyfully admit.

But first we must inquire *whether* what Mill admits is what Whately claims. In saying 'I quite admit that the major is an affirmation of the sufficiency of the evidence on which the conclusion rests', Mill no doubt supposes himself to be admitting Whately's claim that 'the expression of this judgment in words, is *the very Major-premiss* alluded to',¹ where 'this judgment' is 'a judgment that the instance or instances adduced are "*sufficient* to authorize the Conclusion";—that it is "*allowable*" to take these instances as a sample warranting an inference respecting the whole Class'. The question is, then, whether Mill's interpretation is sound.

And in at least one important respect Mill's interpretation is unsound. Misconceiving Whately's claim as the 'principal objection' brought against the 'theory of the syllogism laid down in the preceding pages', Mill misrepresents the scope of

¹ *Elements of Logic*, 8th ed., p. 234.

the claim. Whately is defending the position that all valid arguments are 'capable of being Syllogistically expressed',¹ 'that *all Reasoning*, on whatever subject, is one and the same process, which may be clearly exhibited in the form of Syllogisms' And, in the passage from which Mill quotes, Whately is trying to find the suppressed major premiss 'where an inference is drawn from Induction'² The sentence which Mill 'borrows' must be interpreted by comparison with what Whately has already said:

'I think it clearer, therefore, to state simply and precisely what it is that we do mean to assert And in doing this, we shall find that the expressed premiss of the enthymeme,—*viz* that which contains the statement respecting the individuals—is the *Minor*; and that it is the *Major* that is suppressed, as being in all cases substantially the same: *viz* that *what belongs to the individual or individuals we have examined, belongs* (certainly, or probably, as the case may be) *to the whole class under which they come* E G From finding on examination of several sheep, that they each ruminate, we conclude that the same is the case with the *whole Species* of sheep and from finding on examination of the sheep, ox, deer, and other animals deficient in upper cutting-teeth, that they each ruminate, we conclude (with more or less certainty) that quadrupeds thus deficient are ruminants, the hearer readily supplying, in sense, the suppressed major premiss, *viz* that "what belongs to the individual sheep we have examined, is likely to belong to the whole species," &c.³

Even the sentence which Mill quotes makes it clear that the conclusion of the kind of inference with which Whately is dealing is a conclusion 'respecting the whole Class', so that the kind of inference is that which Mill distinguishes as 'inference from particulars to generals' from 'inference from particulars to particulars'. On another occasion Mill recognizes at least what problem it is that Whately is here trying to solve:

'The statement, that the uniformity of the course of nature is the ultimate major premise in all cases of induction, may be thought to require some explanation The immediate major premise in every inductive argument, it certainly is not. Of that, Archbishop Whately's must be

¹ p. 230² p. 234³ p. 233

held to be the correct account. The induction, "John, Peter, &c are mortal, therefore all mankind are mortal," may, as he justly says, be thrown into a syllogism by prefixing as a major premiss (what is at any rate a necessary condition of the validity of the argument), namely, that what is true of John, Peter, &c is true of all mankind.¹

On the present occasion, however, Mill mistakes Whately's claim for a claim about the nature of the major premiss in general.

Now this mistake about the scope of Whately's claim makes possible a further mistake about the nature of his claim. There can be no attempt to find the major premiss in general. Accordingly, what is really an attempt to find the major premiss of one kind of inference is mistaken for an attempt to interpret any given major premiss. The discovery of the suppressed major premiss of the inferences in question is a more difficult task than either Mill or Whately seems to recognize. Whately's formula, for example, 'that *what belongs to the individual or individuals we have examined, belongs* (certainly, or probably, as the case may be) *to the whole class under which they come*', is surely inadequate, ignoring as it does the necessity of discriminating the kind of character in respect of which generalization would be defensible. It is perhaps because Whately sees this that, in the sentence which Mill quotes, he seeks refuge in an alternative formula which, taken strictly, requires the major premiss in question to specify the conclusion of the inference of which it is the major premiss. It is easy for us to see in this only one of a number of vain struggles to identify an elusive major premiss. But Mill, supposing Whately's claim to be a claim about the nature of the major premiss in general, supposes, accordingly, that Whately is claiming, among other things, that the affirmation of the easily identifiable major premiss of an 'inference to particulars', for example, the proposition that all men are mortal, is 'a judgment that the instance or instances adduced are "*sufficient* to authorize the Conclusion"'.²

Granted, however, that Whately does not claim that the

¹ p. 357.

major premiss in general is 'an affirmation of the sufficiency of the evidence on which the conclusion rests', Whately's doctrine, that all arguments are 'capable of being Syllogistically expressed',¹ itself depends on a failure clearly to grasp the fact that no premiss can answer to this description. That is why I have ventured to say that Whately needs to be told this part of what Mill tells him, namely, that the conclusion 'is inferred from the evidence itself, and not from a recognition of the sufficiency of the evidence'.²

Logicians who hold with Whately that *all* inference is syllogistic, representing what are really complete expressions of non-syllogistic inferences as enthymematic expressions of syllogistic inferences, proceed as if the bare consideration, that the acceptance of a proposition other than the expressed premiss and the expressed conclusion is indispensable to the validity of the inference, sufficed to establish the claim that this third proposition is a suppressed premiss. Logicians who hold with Mill that *no* inference is syllogistic, representing what are really enthymematic expressions of syllogistic inferences as complete expressions of non-syllogistic inferences, fail to recognize the additional characteristics which distinguish a genuine suppressed premiss. What, then, besides the consideration that its acceptance is indispensable to the validity of the inference, is true of the genuine suppressed premiss and distinguishes it from other propositions of which this consideration is true?

Let us first see that the bare consideration, that the acceptance of a proposition other than the expressed premiss and other than the expressed conclusion (and other than any conjunct in either, if either is conjunctive) is indispensable to the validity of the inference, does not suffice to show that the expression is enthymematic. In order to see this, it is necessary to recognize only that, even where '*p*, therefore *q*' is the complete expression of a valid inference (whether syllogistic or non-syllogistic), the acceptance of *p* or *q* is indispensable to the validity of the inference. For it will not be pretended

¹ p. 230.

² pp 235-6.

that this proposition is either the expressed premiss or the expressed conclusion or any conjunct in either

But let us next see further that, even where ' p , therefore q ' is an enthymematic expression of a valid inference, so that there is a suppressed premiss, r , this suppressed premiss must *imply* but cannot *be*: \bar{p} or q . The suppressed premiss must, by definition, be a proposition, r , whose conjunction with p yields the total premiss, so that 'Both p and r , therefore q ' will be the complete expression of a valid inference.

Then, *Both p and r implies q* . Therefore, the alternative proposition, whose alternants are (i) the contradictory of *Both p and r* , (ii) q , is self-evident. Now the contradictory of *Both p and r* is *Either \bar{p} or \bar{r}* . Accordingly, the alternative proposition, whose alternants are (i) *Either \bar{p} or \bar{r}* , (ii) q , is self-evident. But this alternative proposition is identical with that whose alternants are (i) \bar{r} , (ii) *Either \bar{p} or q* . This last being, accordingly, self-evident, r must imply \bar{p} or q .

Again, that 'Both p and \bar{p} or q , therefore q ' would be merely apparent inference may be thus made clear. If the ostensible premiss implied the ostensible conclusion, then the alternative proposition, whose alternants are (i) the contradictory of *Both p and *Either \bar{p} or q** , (ii) q , would be self-evident. But the contradictory of *Both p and *Either \bar{p} or q** is the alternative proposition whose alternants are (i) \bar{p} , (ii) the contradictory of \bar{p} or q . Accordingly, the alternative proposition, whose alternants are (i) \bar{p} , (ii) the contradictory of \bar{p} or q , (iii) q , would be self-evident. But this alternative proposition is identical with that whose alternants are (i) \bar{p} or q , (ii) the contradictory of \bar{p} or q .

Since, then, not only, where ' p , therefore q ' is the complete expression of a valid inference, is the acceptance of \bar{p} or q indispensable to the validity of the inference, but also, where ' p , therefore q ' is an enthymematic expression of a valid inference, \bar{p} or q cannot *be*, though it must *be implied by*, a suppressed premiss, we might expect that a genuine suppressed premiss would be easily identifiable as a proposition which implies, but is not, \bar{p} or q . Where, on the other hand,

' p , therefore q ' is the complete expression of a valid inference, we might expect that \bar{p} or q , being self-evident, could be known without knowing any other proposition, and that there could therefore be no other proposition whose acceptance is indispensable to the validity of the inference. But we have still to reckon with a proposition, the knowing which is an indispensable condition of the knowing \bar{p} or q and thus an indispensable condition, not perhaps of the validity of the inference, but at least of its being knowledge.

Of the valid inference of which ' p , therefore q ' is the complete expression, p implies q is not the principle, but a specification of the principle. Implication is a resultant relation. If p implies q , this can be only because p stands to q in a relation in which propositions other than p may stand to propositions other than q . On this fact, indeed, depends the possibility of logic. Now the principle of the inference ' p , therefore q ' is, not p implies q , but a proposition asserting that *any* proposition implies *any other* to which it stands in the relation, R , where R is that relation which governs the fact that p implies q . For example, the principle of syllogisms in Barbara, namely, that *Both every M is P and every S is M implies Every S is P* , must be distinguished from its specifications, for example, that *Both every man is mortal and every soldier is a man implies Every soldier is mortal*.

And implication is a resultant relation because self-evidence is a resultant relation. In general, if p is self-evident, this can be only because p has a character which other propositions may have. A proposition, that is, can be self-evident only by being of a certain kind. And the knowing the proposition requires the knowing that it is of this kind and that only by being of this kind is it self-evident. And \bar{p} or q can be self-evident only because p stands to q in a relation in which propositions other than p may stand to propositions other than q . The principle of syllogisms in Barbara may also be formulated: It is self-evident that either it is not the case that *Both every M is P and every S is M* or *Every S is P* .

But, granted that the specifications of a principle can be

known only by knowing the principle of which they are specifications, it by no means follows that the relation of a principle to its specifications is that of premiss to conclusion. What we have just recognized is what is false in Locke's account 'Of Maxims'.¹ What we must now go on to recognize is what is true in Locke's account. Locke is right in rejecting the view that the cases (whether specifications or particularizations) of a self-evident rule are to be *deduced from* the rule. Just because the rule is self-evident, so also are the cases of the rule. Locke is wrong only in overstating his refutation of the traditional view. He would be right if he claimed only that a case can be *accepted* without accepting (because without entertaining) the rule, even that the acceptance of a case is a precondition of the acceptance of the rule. He is wrong in claiming, however, that a case can be *known* without knowing the rule. And he says even that the case is no 'better or more certainly'² known with, than without, the knowledge of the rule. But this is wrong, not because the case must be deduced from the rule, but because the failure to detect and know the rule is a failure to grasp the case in that very respect in which the case is self-evident.

At last we are equipped for an exact diagnosis of the mistake of those logicians who hold, with Whately, that all inference is syllogistic. Their mistake is a failure to distinguish these two very different ways in which the knowing one fact may require the knowing another. It being obvious and admitted that the expression, for example, 'A is equal to M, B is equal to M; therefore, A is equal to B' (where A, M, B are either particulars, for example, this or that line, or restricted variables, for example, this or that quantity), if it is the complete expression of a valid inference, must be the expression of a valid non-syllogistic inference, these logicians have to represent the expression as enthymematic. To that end they put forward as a suppressed major premiss the proposition, that things which are equal to the same thing are equal to one another (that, where A, M, B are *unrestricted variables*,

¹ *Essay*, IV, vii.

² § 10.

either it is not the case that *Both A is equal to M and B is equal to M* or *A is equal to B*). Asked how this alleged suppressed major premiss is known, they reply, and rightly, that it is self-evident. But they fail to see that, if so, then the proposition, that, where A, M, B are *either particulars or restricted variables*, either it is not the case that *Both A is equal to M and B is equal to M* or *A is equal to B*, must also be self-evident. And what prevents them from seeing this is the imperfectly diagnosed dependence of the knowledge of the latter upon the knowledge of the former.

The untenability of their position may be appreciated by turning their method against the syllogism itself. Treated in the same way, any syllogism in Barbara, just because it is a syllogism in Barbara, would have to be accounted an enthymeme with, as a suppressed major premiss, the principle of syllogisms in Barbara.

CHAPTER XIII

SURVEY

THAT syllogism is not real but merely apparent inference, Mill argues in two ways.

To Mill as an epistemological empiricist, that syllogism is 'not really entitled to be called reasoning at all', seems 'an inevitable consequence of the doctrine . . . that a syllogism can prove no more than is involved in the premises.'¹ What is this doctrine? It really concerns not syllogism in particular but inference in general. It is the doctrine that inference is valid only where premiss implies conclusion. To this Mill opposes the doctrine that, where premiss implies conclusion, assertion of premiss is assertion of conclusion. Agreeing with the orthodox logician that the premisses of a valid syllogism imply the conclusion, Mill accordingly disagrees with the orthodox logician in diagnosing syllogism as merely apparent inference.

How, consistently with this presentation of the point at issue, are we to define 'imply'? Ascribing to the orthodox logician the doctrine that inference is valid only where premiss implies conclusion, we must distinguish ' p implies q ' from ' q is validly inferable from p '. Ascribing to Mill the doctrine that, where premiss implies conclusion, assertion of premiss is assertion of conclusion, we must distinguish ' p implies q ' from 'Assertion of p is assertion of q '. Our problem may be solved by defining ' p implies q ' as ' \bar{p} or q is self-evident' and defining 'self-evident' as 'legitimately assertable without appeal to evidence other than itself'.

Why does it seem to Mill as an epistemological empiricist that, where \bar{p} or q is self-evident, assertion of p is assertion of q ? As an epistemological empiricist Mill holds that experience is the only evidence and, accordingly, that no fact is self-evident. To be consistent he ought to deny that \bar{p} or q ever can be self-evident. He ought to reject the possibility of implication. Of this toll, which consistency would exact, Mill

¹ p. 209.

refuses payment. The explanation can be sought only in faulty book-keeping. And the careful auditor will find that Mill has failed to balance his account of the merely verbal proposition.

For it is on this account that Mill bases the more subtle of his two devices for exploding apparent self-evidence. Of propositions mistakenly thought to symbolize self-evident facts some really do symbolize facts, and the mistake lies in thinking these propositions legitimately assertable without appeal to experience. We shall find Mill attacking the doctrine that 'the proposition, Two and one is equal to three . . . is . . . but a definition of the word three'¹ and championing the doctrine that these 'so-called definitions are . . . results of induction'.² Other propositions mistakenly thought to symbolize self-evident facts really are legitimately assertable without appeal to experience, and the mistake lies in thinking that these propositions symbolize facts. Such a proposition 'either gives no information, or gives it respecting the name, not the thing'.³ But Mill's opposition of *merely verbal* to *real* requires that such a proposition *both* 'gives no information' *and* 'gives it respecting the name, not the thing'. Only by combining these plainly exclusive alternatives can Mill's merely verbal proposition be assertable without symbolizing fact. If there could be such a monster, it would be legitimately assertable without appeal to evidence and, therefore, without appeal to evidence other than itself.

Our question is now easily answered. It seems to Mill as an epistemological empiricist that, where \bar{p} or q is self-evident, assertion of p is assertion of q , because it seems to Mill as an epistemological empiricist that to be self-evident is to be merely verbal.

Thus grounded on epistemological empiricism, Mill's denial that syllogism is real inference concerns syllogism, not as such, but as inference conforming to the orthodox criterion of validity. "That a syllogism can prove no more than is involved in the premises"⁴ is not in dispute. It is 'admitted by all

¹ p. 292.² p. 297³ p. 129.⁴ p. 209

writers on the subject'. 'The point in dispute is only whether what 'can prove no more than is involved in the premises' is 'entitled to be called reasoning'.

But Mill also grounds his denial that syllogism is real inference on his definition of the universal proposition. Thus grounded, his contention does concern syllogism as such. Mill's chapter 'Of the Functions and Logical Value of the Syllogism' is for this reason preoccupied with the implications of his definition of the universal proposition to the almost total exclusion of the implications of his epistemological empiricism. Its fundamental question is that of the function of the major—the premiss which, by Mill's decision 'to consider the two elementary forms of the first figure as the universal types of all correct ratiocination',¹ must be universal. The chapter is, moreover, much less an attempt to substantiate the far from novel denial that syllogism is real inference than an attempt to show how, though merely apparent inference, syllogism can yet be serviceable. Its title is free from irony.

Mill's definition of the universal proposition is objectionable not as the introduction of a heresy but as the failure to introduce a reform. Only in his loyalty to the definition does Mill depart from the tradition. He sees, where most logicians have failed to see, the implication that 'a general truth is but an aggregate of particular truths'.² This, more judiciously formulated, *that a universal proposition is but a conjunction of singular propositions*, is implied by the definition. For the predicate of the proposition *that all men are mortal* is affirmed 'of all and each of the things denoted by the subject'³ only if this proposition is the conjunctive proposition of which *that Socrates is mortal* is a typical conjunct. That the assertion *that all men are mortal* would be the assertion *that Socrates is mortal*, is an indisputable corollary.

That syllogism is merely apparent inference is, then, involved in Mill's definition of the universal proposition. But Mill insufficiently recognizes how much more is involved. Even syllogism bereft of the minor would be merely apparent

¹ p. 195² p. 213³ p. 93.

inference. The assertion of the bare major would be the assertion of the conclusion. There is consequently some difficulty in seeing what office Mill can consistently bestow on the minor. Syllogism threatens to resemble immediate inference not only in being merely apparent but also in being immediate.

In this diagnosis Mill must acquiesce if we pin him down to the position that believing the major is, even where you do not believe the minor, believing the conclusion. But sympathetic criticism will find a less unpromising position. Where you do not believe the minor, although in asserting the major you assert the conclusion, in believing the major you do not believe the conclusion. To the minor falls the office of revealing that the assertion of the major is the assertion of the conclusion.

In distinguishing three accounts of syllogism, my intention has been not to prejudice but to leave open the question of their consistency. Do they together constitute a single account? In the way of an unqualified answer lies this obstacle: None of the three accounts is consistent with itself. A division into self-consistent passages would cut across my division into three accounts.

My division is not by this admission discredited. We must distinguish the aim of each account from the defectively loyal execution of the aim. Applying this distinction, let us try first to determine the relation between (I) and (II).

(I) is ruled by the following doctrine: Although, where S_1 is M, we in asserting that every M is P must assert, we in judging that every M is P need not judge, that S_1 is P. When, however, we judge both that every M is P and that S_1 is M, we inevitably judge that the assertion that every M is P is the assertion that S_1 is P. Further, when we judge both that every M is P and that the assertion that every M is P is the assertion that S_1 is P, we inevitably judge that S_1 is P. Therefore, when we judge both that every M is P and that S_1 is M, we inevitably judge that S_1 is P. The sole function of syllogism is determined by this doctrine. By confronting the major with the minor, syllogism ascertains that the assertion of the major is the assertion of the conclusion.

If satisfied with this first account, why offer a second? Because, while what syllogism of itself accomplishes is always neither more nor less than ascertaining that assertion of major is assertion of conclusion, the discharge of this sole function subserves a plurality of ulterior purposes. Mill would, I think, say that, while (I) determines what syllogism of itself accomplishes, (II) tells us of the various uses of syllogism. But I think Mill would say this only in forgetfulness of an important part of what (I) does. In the course of (II) Mill distinguishes 'the uses of syllogism, as a mode of verifying any given argument'¹ from 'its ulterior uses, as respects the general course of our intellectual operations'. And of the latter he remarks that they 'hardly require illustration'. Now the true reason why they hardly require illustration is that (I) has already illustrated them. The true reason why (II) tells us almost nothing of these uses is that (I), albeit only to vindicate Mill's view of what syllogism of itself accomplishes, has already told us all Mill has to tell. What I think Mill would say of the difference between the two accounts needs modification accordingly. (I), besides determining what syllogism of itself accomplishes, tells us of 'its ulterior uses, as respects the general course of our intellectual operations'. To (II) are left 'the uses of syllogism, as a mode of verifying any given argument'.

What, then, is the relation between these two accounts? Each aims at exhibiting those uses which fall within its province as uses which syllogism subserves by ascertaining that assertion of major is assertion of conclusion. Judged merely by this consideration of aims, the two accounts would clearly deserve to be rated as different parts of a complex but consistent scheme. Moreover, while the execution of each account is disloyal to its aim, the disloyalty is in neither case the product of mere inadvertence but is in both cases a manifestation of the untenability of a single view of what syllogism of itself accomplishes.

Where every M is P, distinguish in terms of an earlier and a later date three groups of objects which, being M, must be

¹ p. 228.

P: (1) at t_1 both observed to be M and observed to be P, but at t_2 both forgotten to be M and forgotten to be P; (2) at t_1 observed to be M without being observed to be P; (3) at t_1 neither observed to be M nor observed to be P, but at t_2 observed to be M without being observed to be P.

(1) present no problem. At t_1 they are non-inferentially known to be P. At t_2 they are not in any way known to be P. The problem presented by (2) is reserved for (II). *Only by inference* can they be known to be P. But, because they are observed to be M before (1) are forgotten either to be M or to be P, Mill finds no difficulty in insisting that they can *without syllogism* be known to be P. For 'the individual cases are all the evidence we can possess'.¹ 'Not one iota is added to the proof by interpolating a general proposition.' Syllogism is here useless unless 'as a mode of verifying any given argument'. The only problem for (I) is presented by (3).

Mill admits that, if you at t_1 record the conclusion that every M is P and at t_2 consult your record, you can at t_2 come to know that (3) are P. And he admits that, of the operation whereby you come to know this, syllogism is an indispensable part.

That (3) are already at t_1 *asserted* to be P, Mill is bound by his definition of the universal proposition to insist. But (3) are not until t_2 *judged* to be P. Even here Mill wobbles. But the major inconstancy of (I) lies in Mill's answer to a further question. When (3) become known to be P the knowledge, unlike the knowledge that (1) are P and like the knowledge that (2) are P, is plainly inference. *When does this inference occur?*

If, like the inference that (2) are P, its premiss is that (1) are P, it must occur at t_1 . This is the answer countenanced by what I call 'the loyal account of the major'—that we 'record all that we have observed, together with all that we infer from our observations'.² The answer implies the resolution of inferential judgement into inference which is not judgement followed by judgement which is not inference.

Mill's recognition that this will not do appears in what I call

'the disloyal account of the major'—that it comprises further 'instructions for making innumerable inferences in unforeseen cases'. The difference between (2) and (3) is that between foreseen and unforeseen cases, foreseen and unforeseen at t_1 when the instructions are recorded. (2), because foreseen, are already inferred to be P. Just because (3), being unforeseen, cannot yet be inferred to be P, Mill is driven thus to extend the major. When are the instructions obeyed? Only when the unforeseen cases are encountered. Only at t_2 . Now, if Mill admits that (3) are only at t_2 inferred to be P, how, since (1) are at t_2 both forgotten to be M and forgotten to be P, can he escape the admission that the inference is syllogistic? The inference is 'to all intents and purposes, a conclusion from the forgotten facts'.¹ Mill might as well say that t_2 is to all intents and purposes t_1 . 'All that we infer from the memorandum is our own previous belief . . . concerning the inferences which that former experience would warrant'.² But the inference that we formerly believed in our 'instructions for making innumerable inferences in unforeseen cases' cannot be among these 'innumerable inferences'. Mill thus escapes the admission that the inference is syllogistic only by running away from the hypothesis that (3) are only at t_2 inferred to be P. And he runs in two directions: from the later date to the earlier date and from the relevant inference to an irrelevant inference.

(II) is embarrassed by the absence of the very complication whose presence embarrasses (I). Nothing has been forgotten. Where the major deputizes for 'the forgotten facts', Mill's difficulty is to avoid admitting the deputy to the full status of a premiss. Where the 'facts' are still available, Mill's difficulty is to find anything which syllogism can usefully do. Where S_1 can be inferred to be P without recognizing that every M is P, what is the use of ascertaining that asserting that every M is P is asserting that S_1 is P?

Mill tries to exhibit 'the uses of syllogism, as a mode of verifying any given argument' by representing 'the syllogistic form'³ as 'an indispensable collateral security'. But the

¹ p. 221.² p. 223.³ p. 225.

proposition which operates as collateral security turns out to be relevantly different from the major of the corresponding syllogism. It comprises not 'all that we have observed' but, at most, only 'the whole body of possible inferences from a given set of particulars'.¹ Not even this, but only all possible inferences other than that for whose 'correctness' it operates as collateral security—'all possible parallel cases'.²

The crucial question is this: Whence does the collateral security derive its relevance? We are testing our inference that S_1 is P . What constitutes S_2 a parallel case, a case 'to which the same set of evidentiary considerations are applicable'?² The only possible answer is that S_2 is M and that no consideration concerning S_1 except that S_1 is M can be advanced in support of the conclusion that S_1 is P . We may find that, although we were ready to conclude that S_1 is P , we are not ready to conclude that S_2 is P (whether because there is no bias to make us accept insufficient evidence that S_2 is P or because we have evidence that S_2 is not P). We are now no longer ready to conclude that S_1 is P . Why? Because we are no longer ready to treat the proposition that every M is P as a premiss. What we have done is this: Recognizing that our inference that S_1 is P is a syllogism, we have tested (and discredited) the major by making it the major of another syllogism.

But, if syllogism ascertains only that assertion of major is assertion of conclusion, what is its use 'as a mode of verifying any given argument'? By 'ascending to the general proposition, we bring under our view . . . all possible parallel cases'.² Now S_1 is already 'under our view'. Granted that syllogism may ascertain a connexion between the major and S_2 , what connexion between the major and S_1 makes a connexion between the major and S_2 pertinent? Not that asserting the major is asserting that S_1 is P .

Yet Mill concedes that 'it is always possible, and generally advantageous, to divert our argument into the circuitous channel of an induction from those known cases to a general

¹ p. 225

² p. 227.

proposition, and a subsequent application of that general proposition to the unknown case' ¹ But the peculiarity of the 'circuitous channel' should be an application of the general proposition to 'parallel cases'. Mill cannot consistently concede an application to 'the unknown case'.

And the concession is itself an untenable compromise. If, in concluding that S_1 is P, 'our argument' relies on no consideration concerning S_1 except that S_1 is M, there is no less 'circuitous channel' from which 'to divert our argument'. If our argument does rely on another consideration concerning S_1 , it must flow through another 'circuitous channel' and cannot be diverted into this one.

What is Mill's reply to this dilemma? He tries to escape between the horns. What he calls 'our argument' relies on *no* consideration concerning S_1 . 'Not only *may* we reason from particulars to particulars without passing through generals, but we perpetually do so reason'.² No doubt we perpetually so proceed. But so to proceed is not to reason.

It is because he thus mistakes *jumping to a conclusion for reasoning* that Mill also mistakes *reasoning for appeal to a collateral security*.

'I cannot perceive why it should be impossible to journey from one place to another unless we "march up a hill, and then march down again" It may be the safest road, and there may be a resting-place at the top of the hill, affording a commanding view of the surrounding country, but for the mere purpose of arriving at our journey's end, our taking that road is perfectly optional; it is a question of time, trouble, and danger'³

The top of the hill is the major. The surrounding country is 'the whole body of possible inferences from a given set of particulars'.⁴ If our journey's end is to be inference, this inference is part of the surrounding country, and we must march up the hill to gain a commanding view of this part. We may but need not survey the remainder. But Mill thinks that a survey of the remainder is all the ascent can yield.

The truth is that Mill is marching through flat country. His

¹ p. 227.

² p. 215.

³ pp. 214-15

⁴ p. 2-5

loyalty to his definition of the universal proposition has spread the hill over the surrounding country, and confined him to the plain. A universal proposition being but a conjunction of singulars, to turn from one of these singulars to the universal is to turn only to others of these singulars.

The first two accounts of syllogism are conceived by Mill as together covering the field. What the immediate sequel explores may be a contiguous field. It is certainly no part of the same field. 'To complete the series of considerations connected with the philosophical character of the syllogism, it is requisite to consider, since the syllogism is not the universal type of the reasoning process, what is the real type.'¹ However 'connected with the philosophical character of the syllogism', to consider this is to consider something other than syllogism. Why, having (§§ 6-7) considered this, does Mill offer (§ 8) yet a third account of syllogism?

Mill's answer is clear. (III) is designed as a defence of 'the theory of the syllogism laid down in the preceding pages'² against what Mill supposes the 'principal objection' of its critics.

Thus defined, the aim of (III) is by definition consistent with the theory 'laid down in the preceding pages'. But the aim of (III) may be more specifically defined. Conceding what he considers the substance of the objection, conceding 'that the major is an affirmation of the sufficiency of the evidence on which the conclusion rests',³ Mill's defence aims at showing that this 'is the very essence of my own theory'.³ Thus defined, the aim of (III) is not consistent with the theory 'laid down in the preceding pages'.

That the assertion *that every M is P* is an affirmation of the sufficiency of the evidence on which the conclusion *that S₁ is P* rests, might, where S₁ is M, be said by a philosopher who identifies the proposition *that every M is P* with the proposition *that being M is sufficient evidence of being P*. The same thing might be said by a philosopher who identifies the proposition *that every M is P* with the proposition *that there is sufficient*

¹ p. 229.

² p. 234.

³ p. 235.

evidence for every assertion affirming P of anything which is M. Mill's rejection of the doctrine that the syllogistic conclusion is validly inferable from the syllogistic minor and his admission that the syllogistic major is 'an assertion of the existence of evidence sufficient to prove any conclusion of a given description'¹ show that it is the latter rather than the former of these identifications that attracts him. But what might be said by a philosopher who defends either of these identifications cannot be consistently said by a philosopher who identifies the proposition *that every M is P* with the conjunctive proposition of which *that S₁ is P* is a typical conjunct.

The position 'that the major is an affirmation of the sufficiency of the evidence on which the conclusion rests' has nevertheless something important in common with the position required by Mill's definition of the universal proposition. The major cannot be a premiss. Mill sees this. "The conclusion in an induction is inferred from the evidence itself, and not from a recognition of the sufficiency of the evidence"² And, if we disengage this truth from Mill's erroneous denial 'that this recognition of the sufficiency of the evidence . . . is a part of the induction itself',³ we are better equipped than either Mill or Whately for determining the conditions under which inference is enthymematic. We are consequently able to diagnose, not only the mistake of those logicians who hold with Mill that *no* inference is syllogism, but also the mistake of those logicians who hold with Whately that *all* inference is syllogism. Against the former we urge that, where *q* is validly inferable from *p*, \bar{p} or *q* must be self-evident. Against the latter we urge that, where \bar{p} or *q* is self-evident, *q* must be validly inferable from *p*. To this we add that the specifications of a self-evident principle are themselves self-evident.

¹ p 230.² pp 235-6.³ p 235.

CHAPTER XIV

DEDUCTIVE SCIENCE¹

THE central question of the remaining chapters of Book II is the question formulated at the beginning of Chapter v:

'Why are mathematics by almost all philosophers, and (by some) even those branches of natural philosophy which, through the medium of mathematics, have been converted into deductive sciences, considered to be independent of the evidence of experience and observation, and characterized as systems of Necessary Truth?'²

It being obvious that they are so considered because the propositions of which they consist are considered to be exhaustively divisible into propositions necessary *per se* and propositions necessary relatively to propositions necessary *per se*, exhaustively divisible, that is, into self-evident propositions and deductions from self-evident propositions, and Mill having already, in Chapter i and in Chapter iii, expounded his view of the nature of deduction, the only new fundamental question is that of the nature of our knowledge of the ultimate premisses of the alleged 'systems of Necessary Truth'. Against this delimitation of the task of the remaining chapters of Book II it might be objected that, granted that Mill has already expounded his view of the nature of a single deductive step, he has still to expound his view of the nature

¹ To Jevons's attack on 'Mill's doctrines concerning geometrical reasoning' (*Contemporary Review*, 1877, *Pure Logic and other Minor Works*, pp. 199-221) I have replied in an article to be published in *Mind*. I have there discussed, as the space at my disposal does not allow me here to discuss, Mill's attitude toward the failure of real (sensible) things exactly to conform to geometrical definitions. We must distinguish *three* problems presented by this inexact conformity: (1) How can geometrical propositions be *meaningful*? (2) How can they be *true*? (3) How can they be *evident*? In solving none of these problems does Mill claim that imaginary things (images) come any nearer than do real things to satisfying geometrical definitions. His solution of (1) is (following Berkeley and Hume in conceding *abstraction* while rejecting *abstract ideas*) that real things may be 'feigned' exactly to conform. His solution of (2) is (following Stewart) an admission that geometrical propositions are not exactly true. His solution of (3) is an appeal to 'the mathematical Doctrine of Limits'. Jevons's view, 'that Mill considers our knowledge of geometry to be founded to a great extent on *mental experimentation*', rests on a thorough misunderstanding of what Mill says

of a train of deductive reasoning. The same proposition may no doubt be both the conclusion of one deduction and a premiss of another. And the deductive sciences do no doubt copiously illustrate this possibility. Only because they do is it necessary to distinguish their *ultimate* premisses. But the nature of a train of reasoning is given when the nature of each step is given. Mill ought not, therefore, to have anything new to say about the relations of the conclusions, to the ultimate premisses, of the deductive sciences. Having been already told that the conclusions are merely apparently inferred from their *proximate* premisses, we do not need still to be told that the conclusions are merely apparently inferred from their *ultimate* premisses.

It might be suggested that the failure of Mill's attempt, in Chapter iv, to analyse trains of deductive reasoning in geometry has at least this claim upon our attention, that it confirms our rejection of the view that deduction is merely apparent inference. The true explanation, however, of the failure of Mill's attempt is to be found in the fact that syllogism is not the only type of deduction. And, in trying to force non-syllogistic deduction into syllogistic form, Mill is a victim not of the heretical, but of the orthodox, features of his system.

Instead, then, of discussing Mill's treatment of trains of deductive reasoning, I shall take it for granted that his explanation of the merely relative necessity of the conclusions of the deductive sciences is that the assertion of the conjunction of their ultimate premisses is the assertion of the conjunction of their conclusions. What we still want to learn, in order to understand his explanation of the seeming absolute necessity of the conclusions of the deductive sciences, is only his explanation of the seeming necessity *per se* of their ultimate premisses.

Bearing in mind the dependence of Mill's explanation of the relative necessity of the conclusion of a deduction, namely, that deduction is merely apparent inference, upon his explanation of the necessity *per se* of the alternative proposition whose alternants are (1) the contradictory of the premiss, (11)

that this line, or that some line, is the shortest distance between two points, are, on the other hand, not geometrical propositions and not 'peculiarly certain'. Mill is anxious to avoid saying that geometry is 'conversant about non-entities'.¹ But no hypothetical proposition is *about* entities. A hypothetical proposition may be *true of* an entity. In other words, its antecedent, and so its consequent, may be fulfilled. But to assert it is not to *assert* this.

Even if the explanation which Mill thus bases on his treatment of the 'so-called definitions' were, so far as it went, sound, it would go only part of the way. For Mill thinks that Whewell has 'greatly the advantage of Stewart on another important point in the theory of geometrical reasoning; the necessity of admitting, among those first principles, axioms as well as definitions'.² Now Mill's treatment of the 'so-called definitions' can afford, in the first place, no explanation of the seeming necessity of the axioms. For the axioms

'differ from that other class of fundamental principles which are involved in the definitions, in this, that they are true without any mixture of hypothesis. That things which are equal to the same thing are equal to one another, is as true of the lines and figures in nature, as it would be of the imaginary ones assumed in the definitions'³

We may observe, in passing, that Mill thus affirms of the axioms what he denies of 'that other class of fundamental principles which are involved in the definitions' only because he attends, in his treatment of the axioms, to the distinction which he ignores in his treatment of the 'so-called definitions'—the distinction between a hypothetical proposition and its consequent. 'That things which are equal to the same thing are equal to one another' is 'true of the lines and figures in nature' not in the sense that, the antecedent being fulfilled, the consequent also is fulfilled, but only in the sense that, if the antecedent were fulfilled, the consequent would be fulfilled. Even if the axiom were 'true of the lines and figures in nature' in the former sense, this would be irrelevant to mathematics. But what is important for our present purpose is only that

¹ p. 260.² p. 264.³ p. 265.

Mill does admit that the axioms 'are true without any mixture of hypothesis'. Of the seeming necessity of the axioms, then, Mill's treatment of the 'so-called definitions' can afford no explanation.

And it plainly follows, in the second place, though Mill seems by no means always to see that it follows, that the seeming necessity of the conclusions of the deductive sciences, so far as axioms are among their ultimate premisses, is also not to be explained by any peculiarity of the definitions. *Sectetur partem conclusio deteriore.* And Mill does seem on at least some occasions to see this:

'The results of those sciences are indeed necessary, in the sense of necessarily following from certain first principles, commonly called axioms and definitions, that is, of being certainly true if those axioms and definitions are so, for the word necessity, even in this acceptation of it, means no more than certainty. But their claim to the character of necessity in any sense beyond this, as implying an evidence independent of and superior to observation and experience, must depend on the previous establishment of such a claim in favour of the definitions and axioms themselves',¹

in favour, that is, of both the definitions and the axioms. In the same way, an explanation of the seeming necessity of the conclusions must be an explanation of the seeming necessity of not only some, but of all, the 'first principles', as well as of the seeming necessity with which the conclusions follow from the 'first principles'.

Since, moreover, not only the axioms but also the definitions are held by Mill to be 'generalizations from experience',² 'results of induction',³ if he succeeds in explaining the seeming necessity of the axioms, he can easily extend the explanation to the seeming necessity of the definitions. Since, further, as long as Mill stands by his treatment of deduction he is bound to explain the seeming necessity with which the conclusions follow by his doctrine of merely apparent inference, the part played by his treatment of definitions in his explanation of the

¹ p. 290

² p. 291

³ p. 297.

seeming necessity of the deductive sciences is not even indispensable.

Mill's doctrine concerning our knowledge of axioms is formulated in § 4 of Chapter v:

'It remains to inquire, what is the ground of our belief in axioms—what is the evidence on which they rest? I answer, they are experimental truths, generalizations from observation. The proposition, Two straight lines cannot inclose a space—or in other words, Two straight lines which have once met, do not meet again, but continue to diverge—is an induction from the evidence of our senses'¹

And, remarking 'This opinion runs counter to a scientific prejudice of long standing and great strength, and there is probably no proposition enunciated in this work for which a more unfavourable reception is to be expected', Mill not only devotes the remainder of Chapter v to an attempt to combat the 'scientific prejudice' but also returns to the task in Chapter vii.

In explanation, but not in justification, of Mill's method, two considerations may be advanced.

(1) The appropriate place for a treatment of the question of the evidence on which axioms rest depends on the way in which the question is answered. And, while Book II would be the appropriate place for an exposition and a defence of the orthodox answer, that axioms are self-evident propositions, the appropriate place for an exposition and a defence of Mill's answer, that axioms 'are experimental truths; generalizations from observation', would be Book III. It is in Book III that Mill expounds and defends exactly the same answer to the question of the evidence on which 'the uniformity of the course of nature' or 'the law of causality' rests. And it is worth noticing that Mill's decision to reserve his defence of his view of our evidence for these propositions until Chapter xxi of Book III, instead of producing it in Chapter iii of Book III, seems to be determined only by the embarrassment arising out of his treatment of axioms in general in Book II:

'It was not to be expected that in the case of this axiom, any more than

¹ p. 266.

of other axioms, there should be unanimity among thinkers with respect to the grounds on which it is to be received as true. I have already stated that I regard it as itself a generalization from experience. Others hold it to be a principle which, antecedently to any verification by experience, we are compelled by the constitution of our thinking faculty to assume as true. Having so recently, and at so much length, combated a similar doctrine as applied to the axioms of mathematics, by arguments which are in a great measure applicable to the present case, I shall defer the more particular discussion of this controverted point in regard to the fundamental axiom of induction, until a more advanced period of our inquiry.¹

Now Mill's defence of his answer, whether to the question of our knowledge of this axiom in particular or to the question of our knowledge of axioms in general, depends on his view 'that induction by simple enumeration may in some remarkable cases amount practically to proof'.² He is, accordingly, unable in Book II to defend his own answer to the question of our knowledge of axioms. And, being unable to defend his own answer, he falls back upon the plan of attacking the answer of an 'eminent champion of the contrary opinion'.³

(2) But Mill also thinks:

'The burden of proof lies on the advocates of the contrary opinion. It is for them to point out some fact, inconsistent with the supposition that this part of our knowledge of nature is derived from the same sources as every other part.'⁴

And Mill thinks this because he confuses an epistemological question, namely, the question of the evidence on which axioms rest, with a psychological (genetic) question, namely, the question of the causes which produce belief in axioms. The confusion is unmistakable in passages of which the following is a sample:

'Where then is the necessity for assuming that our recognition of these truths has a different origin from the rest of our knowledge, when its existence is perfectly accounted for by supposing its origin to be the same? when the causes which produce belief in all other instances, exist in this instance, and in a degree of strength as much superior to what exists in other cases, as the intensity of the belief itself is superior?'⁴

¹ p. 358.

² p. 361.

³ p. 266.

⁴ p. 267.

It is under the influence of this misconception that Mill sinks the question, whether axioms are *a priori* or *a posteriori* truths, in the question, whether Whewell has produced conclusive 'arguments in support of the theory that axioms are *à priori* truths'.¹

'I consider it very fortunate that so eminent a champion of the contrary opinion as Dr Whewell, has found occasion for a most elaborate treatment of the whole theory of axioms, in attempting to construct the philosophy of the mathematical and physical sciences on the basis of the doctrine against which I now contend. Whoever is anxious that a discussion should go to the bottom of the subject, must rejoice to see the opposite side of the question worthily represented. If what is said by Dr. Whewell, in support of an opinion which he has made the foundation of a systematic work, can be shown not to be conclusive, enough will have been done, without going elsewhere in quest of stronger arguments and a more powerful adversary.'²

Of the two main arguments, to which, because unable to 'prove chronologically that we had the conviction (at least practically) so early in infancy as to be anterior to those impressions on the senses, upon which, on the other theory, the conviction is founded',³ the 'advocates of the *à priori* theory are obliged to have recourse', the one is presented as follows:

'In the first place it is said, that if our assent to the proposition that two straight lines cannot inclose a space, were derived from the senses, we could only be convinced of its truth by actual trial, that is, by seeing or feeling the straight lines, whereas in fact it is seen to be true by merely thinking of them. That a stone thrown into water goes to the bottom, may be perceived by our senses, but mere thinking of a stone thrown into the water would never have led us to that conclusion. not so, however, with the axioms relating to straight lines. if I could be made to conceive what a straight line is, without having seen one, I should at once recognise that two such lines cannot inclose a space. Intuition is "imaginary looking;" but experience must be real looking: if we see a property of straight lines to be true by merely fancying ourselves to be looking at them, the ground of our belief cannot be the senses, or experience; it must be something mental.'⁴

This objection is not sufficiently clearly formulated; and a

¹ p. 273

² p. 266.

³ p. 268

⁴ pp. 268-9.

failure to make up his mind about the scope of the objection is, I think, largely responsible for the defects of Mill's reply. It is indispensable to begin by pointing out the confusion—a confusion which culminates in the sentence 'Intuition is "imaginary looking"'—between *intuition*, that is, the recognition of self-evidence, and *imagination (imaging)*, that is, the experiencing of an image. It has next to be decided whether the epistemological empiricist is being challenged to do both or only one, and, if only one, which, of the following things: Has he to establish only the *relevance*, as data, of images? Or has he to establish further their *sufficiency*?

The fact that images are relevant as data in geometry, though irrelevant in the physical sciences, could be easily accommodated. And I think that Mill does, at least incidentally, give the right answer when he says:

'For in all systems of experimentation we take some objects to serve as representatives of all which resemble them, and in the present case the conditions which qualify a real object to be the representative of its class, are completely fulfilled by an object existing only in our fancy.'¹

Images, just as much as *sensa*, since they just as much as *sensa* satisfy geometrical definitions, are cases in point, and must obey geometrical laws. Not satisfying physical definitions, they cannot be expected to obey physical laws.

It is a further, and a more formidable, question for the epistemological empiricist, by what right we take images to be typical not merely of images but also of *sensa*. And it is here that Mill gets into difficulties. Sympathetic interpretation may, I think, detect an answer on these lines: We are not confined to images. What has to be shown, therefore, is only that on any one occasion we rightly take an image to be typical of *sensa* as well as of images. Now we have already examined both *sensa* and images, and we have thereby ascertained that they obey the same geometrical laws. Once we have ascertained this, we rightly take an image to be typical of *sensa* and we rightly take a *sensum* to be typical of images.

Unfortunately, Mill introduces false and irrelevant claims

¹ p. 270.

about the perfection of our recollection of shapes. He does so partly because he does not clearly grasp the nature of the fact that geometrical propositions are hypothetical. He is, however, at a further disadvantage, because he is not yet ready to produce his theory of induction. This further disadvantage appears both in the extreme poverty of his reply to what he treats as a subsidiary argument—that we cannot follow lines ‘prolonged to infinity’—and in the extreme inconsistency of his reply¹ to the argument that geometrical definitions are not satisfied in sensuous experience. For Mill here appeals to ‘one of the four Inductive Methods hereinafter characterized, the Method of Concomitant Variations; of which the mathematical Doctrine of Limits presents the extreme case’² in entire forgetfulness of the consideration that these Methods, based by him on the law of causation, are, as expounded by him, applicable only to ‘successive phenomena’,³ while ‘the laws of extension and figure (in other words, the theorems of geometry, from its lowest to its highest branches) are, on the contrary, laws of simultaneous phenomena only’.

The other main argument ‘in support of the theory that axioms are *à priori* truths’, Mill considers to be ‘usually the most relied on’. He begins by presenting it as follows: ‘Axioms (it is asserted) are conceived by us not only as true, but as universally and necessarily true. Now, experience cannot possibly give to any proposition this character.’⁴ But what determines Mill’s treatment is his interpretation of one of the many passages in which Whewell attempts elucidation:

“Necessary Truths are those in which we not only learn that the proposition *is* true, but see that it *must be* true; in which the negation of the truth is not only false, but impossible, in which we cannot, even by an effort of imagination, or in a supposition, conceive the reverse of that which is asserted ”⁵

On this Mill comments:

‘Although Dr Whewell has naturally and properly employed a variety of phrases to bring his meaning more forcibly home, he would, I

¹ In the footnote to § 4.

² p. 373.

³ p. 273.

⁴ p. 268, note.

⁵ p. 274.

presume, allow that they are all equivalent, and that what he means by a necessary truth, would be sufficiently defined, a proposition the negation of which is not only false but inconceivable. I am unable to find in any of his expressions, turn them what way you will, a meaning beyond this, and I do not believe he would contend that they mean anything more."

Mill concludes:

"This, therefore, is the principle asserted that propositions, the negation of which is inconceivable, or in other words, which we cannot figure to ourselves as being false, must rest on evidence of a higher and more cogent description than any which experience can afford."

And, voicing his 'wonder that so much stress should be laid on the circumstance of inconceivableness', Mill proceeds to an examination of what he even goes so far as to label 'the theory of inconceivableness'.²

Now Whewell *does* say that 'the test of Axioms is that the contrary of them is inconceivable'³ and that 'we may take it as the mark of a necessary truth, that we cannot conceive the contrary distinctly'.⁴ But Whewell *also* says: 'One mode in which we may express the difference of necessary truths and truths of experience, is, that necessary truths are those of which we cannot distinctly conceive the contrary.'⁵ And I think that Mill is probably right in his conjecture: 'Although Dr. Whewell has naturally and properly employed a variety of phrases to bring his meaning more forcibly home, he would, I presume, allow that they are all equivalent.' But, just because Mill is probably right in this conjecture, he is probably wrong in his further conjecture 'that what he means by a necessary truth, would be sufficiently defined, a proposition the negation of which is not only false but inconceivable'. Mill, however, appears to think that the latter conjecture follows from the former. If so, Mill is certainly mistaken. That what a writer 'means by' one expression 'would be sufficiently defined' by another expression, certainly does not follow from the bare consideration that he would allow that the expressions are equivalent. A writer

¹ p. 274.

³ *Philosophy of Discovery*, c. xxviii, § 8.

⁴ Appendix E, § 25.

² p. 281.

⁵ *Ibid.*, § 3.

might, for example, allow the equivalence of the expressions ' p is necessary' and ' \bar{p} is impossible'. That what he meant by the former would be sufficiently defined by the latter would certainly not follow.

And ' \bar{p} is impossible' is among the equivalents of ' p is necessary' which are offered in the passage quoted by Mill, the other equivalents being ' p must be true' and ' \bar{p} is inconceivable'. Sharing Mill's 'wonder that so much stress should be laid on the circumstance of inconceivableness', we may wonder also whether as much stress is laid by Whewell as by Mill.

Whatever be the meaning of 'conceive' and, accordingly, of 'inconceivable', ' \bar{p} is inconceivable' can tell us no more than 'To conceive \bar{p} is impossible'. To offer ' \bar{p} is inconceivable' as a sufficient definition of ' p is necessary' is tantamount to offering 'To conceive \bar{p} is impossible' as a sufficient definition of ' \bar{p} is impossible'. And here, whatever be the meaning of 'definition', whether 'inconceivable' be offered as a guide to the meaning of 'impossible' or inconceivability be offered as a criterion of impossibility, the operation would be plainly circular.

While there is, therefore, nothing to be gained by substituting 'proposition the negation of which is not only false but inconceivable' for 'necessary truth', it must be further objected that, if 'conceive' (and, accordingly, 'inconceivable') has more than one meaning, something may be lost. Now, in his examination, in Chapter vii, of Spencer's estimate of "the worth of the test of inconceivableness",¹ Mill finds it 'necessary to advert to a double meaning of the word inconceivable'.² This he expounds as follows:

'By inconceivableness is sometimes meant, inability to form or get rid of an *idea*, sometimes, inability to form or get rid of a *belief*. The former meaning is the most conformable to the analogy of language; for a conception always means an idea, and never a belief. The wrong meaning of "inconceivable" is, however, fully as frequent in philosophical discussion as the right meaning, and the intuitive school of metaphysicians could not well do without either.'³

¹ p 301

² p 310

³ p 310 In *An Examination of Mr J S Mill's Philosophy*, published in

That Mill should have allowed § 6 of Chapter v to survive this discovery betrays his methods of revision. He justly complains that, although we 'know positively that Mr. Spencer always endeavours to use the word inconceivable in this, its proper, sense',¹ it may 'be questioned whether his endeavour is always successful; whether the other, and popular use of the word does not sometimes creep in with its associations, and prevent him from maintaining a clear separation between the two'. But his own earlier treatment, in Chapter v, is exposed to an even more damaging *tu quoque*. The meaning of the expression 'the negation of which is inconceivable'² is there offered 'in other words'. The other words are: 'which we cannot figure to ourselves as being false'. May we not complain that, although we know that Mill always endeavours to use the word 'inconceivable' in this, its wrong, sense, it may be questioned whether his endeavour is always successful?

For, in Mill's argument in support of the claim 'that our capacity or incapacity of conceiving a thing has very little to do with the possibility of the thing in itself; but is in truth very much an affair of accident, and depends on the past history and habits of our own minds',³ the 'right' meaning of 'inconceivable' is, if not 'fully as frequent' as the 'wrong' meaning, at least indispensable among those present. Like 'the intuitive school of metaphysicians'⁴ Mill 'could not well do without either'. But Mill does not recognize the presence of the 'right' meaning. And only his failure to recognize its

1866, McCosh says (p. 241, note) 'The printing of this work had proceeded thus far, when I observed that Mr. M., in 6th edition of *Logic*, just published, has been obliged, in defending himself against Mr. Spencer, to notice that "conceive" might signify "to have an idea" or "to have a belief"'. In his *Life of John Stuart Mill*, Courtney, speaking of the winter of 1865-6, says (p. 160) 'He also brought out a new edition of his *Logic*, in which he argued for the first time against Spencer's "inconceivability of the opposite" as a test of truth'. Even Bain, who assisted Mill in the preparation of the sixth edition, says of it (*Mind*, 1880, p. 98) 'It was in this edition that he first combated Mr. Spencer's doctrine of "Inconceivability of the opposite" as a test of truth'.

The reply to Spencer, with its distinction between two meanings of 'inconceivableness', will be found in the fourth edition, published in 1856, ten years before McCosh's book

¹ p. 311

² p. 274.
⁴ p. 310.

³ pp. 274-5.

presence can account for the conspicuous conflict between his earlier and his later treatment of the same illustrations. Mill completes his exposition of the 'double meaning of the word inconceivable' thus:

'To illustrate the difference, we will take two contrasted examples. The early physical speculators considered antipodes incredible, because inconceivable. But antipodes were not inconceivable in the primitive sense of the word. An idea of them could be formed without difficulty, they could be completely pictured to the mental eye. What was difficult, and as it then seemed, impossible, was to apprehend them as believable. The idea could be put together, of men sticking on by their feet to the under side of the earth; but the belief *would* follow, that they must fall off. Antipodes were not unimaginable, but they were unbelievable. On the other hand, when I endeavour to conceive an end to extension, the two ideas refuse to come together. When I attempt to form a conception of the last point of space, I cannot help figuring to myself a vast space beyond that last point. The combination is, under the conditions of our experience, unimaginable.'¹

But in Chapter v Mill illustrates the dependence of 'our capacity or incapacity of conceiving a thing' upon 'the past history and habits of our own minds' by

'instances in which the most instructed men rejected as impossible, because inconceivable, things which their posterity, by earlier practice and longer perseverance in the attempt, found it quite easy to conceive, and which everybody now knows to be true. There was a time when men of the most cultivated intellects, and the most emancipated from the dominion of early prejudice, could not credit the existence of antipodes; were unable to conceive, in opposition to old association, the force of gravity acting upwards instead of downwards.'²

Mill proceeds:

'If, then, it be so natural to the human mind, even in a high state of culture, to be incapable of conceiving, and on that ground to believe impossible, what is afterwards not only found to be conceivable but proved to be true; what wonder if in cases where the association is still older, more confirmed, and more familiar, and in which nothing ever occurs to shake our conviction, or even suggest to us any conception at variance with the association, the acquired incapacity should continue, and be mistaken for a natural incapacity?'³

¹ p. 310.

² pp. 275-6.

³ p. 277

And, in illustration.

'But when experience affords no model on which to shape the new conception, how is it possible for us to form it? How, for example, can we imagine an end to space or time? We never saw any object without something beyond it, nor experienced any feeling without something following it. When, therefore, we attempt to conceive the last point of space, we have the idea irresistibly raised of other points beyond it'¹

Here the only difference between the inconceivability of 'antipodes' and the inconceivability of 'the last point of space' is the difference between a curable and an incurable incapacity. Until our minds have profited by the analogies which experience affords, we are here represented as not only believing antipodes to be impossible, but as believing this on the ground of a genuine incapacity to conceive them

Not only ought Mill to have treated the ambiguity of the word 'inconceivable' at an earlier stage. He ought to have treated it more thoroughly than he ever does. Of his two meanings of 'inconceivable' the one is, as he says, that of 'unbelievable'.² It is also, as Mill fails to see, one meaning of 'unimaginable'. But does Mill firmly grasp the meaning of 'unbelievable'? 'By inconceivableness is sometimes meant, inability to form or get rid of an *idea*; sometimes, inability to form or get rid of a *belief*.'³ But he should say 'inability to get rid of a belief', and he should not say 'inability to form a belief'. 'The idea could be put together, of men sticking on by their feet to the under side of the earth; but the belief *would* follow, that they must fall off.' This is right. 'What was difficult, and as it then seemed, impossible, was to apprehend them as believable.' This is wrong. It seems that in his reverence for 'the analogy of language' Mill does not firmly grasp the fact that the meaning of 'unbelievable' is, not that of 'unable to be believed', but that of 'unable not to be disbelieved'. But a firm grasp of this fact is an indispensable qualification for rating at its true value the proposal to define 'necessary truth'⁴ as 'proposition the negation of which is not only false but inconceivable'. Recognizing that this is equivalent not to

¹ p 277

² p 310

³ p 310

⁴ p 274

'proposition the negation of which is unable to be believed' but to 'proposition the negation of which is unable not to be disbelieved', we should surely prefer, if we are set on defining 'necessary truth' in terms of our psychical dispositions, the definition 'proposition unable not to be believed', as indeed Mill inconsistently does when he offers 'which we cannot figure to ourselves as being false'.¹

But all such definitions are worthless. Belief is not volition. Any truth is unable not to be believed by a mind in command of the evidence for it. Contingent truths, no less than necessary truths, compel assent. Evidence grasped in perception and in introspection is, as Mill sees,² typically irresistible. Moreover, while the conditions under which the evidence for a *necessary* truth, are different from the conditions under which the evidence for a *contingent* truth, is under command, the difference is certainly not that the evidence for a necessary truth is commanded by every mind. To command the evidence for a truth *a priori* demonstrable but not intuitable, we must both intuit its ultimate premisses and intuit its connexion with them. To command the evidence for an intuitable truth, we must understand the truth itself.

This is, I think, the substance of Whewell's unhappily named 'doctrine that necessary truth is progressive'.³ And, since to say in what circumstances the contradictory of a necessary truth is, while the contradictory of a contingent truth is not, 'unbelievable' is no easier than to say, without reference to belief, what a necessary truth is, Mill can fairly claim to have found in this doctrine 'the *reductio ad absurdum* of the theory of inconceivableness'.⁴ But Mill thinks that he thereby finds also the *reductio ad absurdum* of the distinction between necessary and contingent truths.

To Mill as an epistemological empiricist deductive science presents two formidable problems Deductive science is

¹ p. 274

² p. 312 Cf. Hume, *Treatise*, Book I, Part I, Sect. iv, p. 47

³ *Philosophy of Discovery*, c. xxix

⁴ p. 281.

'considered to be independent of the evidence of experience and observation'.¹ Holding that there can be no other evidence, Mill seems bound to seek in experience the evidence which those who are not epistemological empiricists are at liberty to seek elsewhere. Now the propositions knowable by deductive science are exhaustively divisible into *conclusions* and *ultimate premisses*. And the acceptance of a conclusion, *q*, involves, besides the acceptance of an ultimate premiss, *p*, the acceptance of the proposition \bar{p} or *q*. The two epistemological problems are, therefore, these: (1) How do we know ultimate premisses? (2) How do we know such propositions as \bar{p} or *q*? Those who are not epistemological empiricists may find, in self-evidence, a solution of both problems. But epistemological empiricism admits among ultimate data only singular categoricals. By definition, ultimate premisses are not known by inference. And the suggestion, that such propositions as \bar{p} or *q* are known by inference, is easily seen to involve an infinite regress. How, then, is an epistemological empiricist to solve the two problems?

Mill admits that such propositions as \bar{p} or *q* are legitimately assertable without appeal to experience, but only because, being *merely verbal*, they are legitimately assertable without appeal to evidence. Deduction is *merely apparent* inference; the assertion of *p* is the assertion of *q*.

But Mill sturdily opposes the application of this type of solution to *axioms*. These, he insists, are *real* propositions. The demand for evidence must, therefore, be met. But the demand can be met only by challenging the view that axioms are ultimate premisses, and by adopting the view that axioms are validly inferable from the singular categoricals which exhaust the ultimate data admitted by epistemological empiricism. Since axioms are held to be reached, not by *merely apparent*, but by *real*, inference, namely, *induction by simple enumeration*, the solution of the problem is a task, not for *deductive*, but for *inductive*, logic.

How, then, does *deductive* science differ from *inductive*

¹ p. 258.

science? The orthodox answer is that, all valid inference being *deductive*, the difference must lie in the ultimate premisses. *Deductive* science appeals only to self-evident ultimate premisses. *Inductive* science has recourse to perceptual and introspective data. From *this* answer Mill has clearly dissociated himself. In order to see what answer Mill at least thinks still open to him, it is necessary to examine his *inductive* logic. Success in that enterprise requires a firm grasp of a generally neglected fact. Although Mill thinks that deduction is *merely apparent* inference, he also thinks that *merely apparent* inference is an indispensable test of the validity of *real* inference. Those who forget this find Mill's *inductive* logic full of disconcerting surprises.

INDEX OF PROPER NAMES

- Adamson, R , vii.
 Aldrich, 68.
 Aristotle, v, vii

 Bacon, F , 18, 22
 Bain, A , 73, 187 n
 Berkeley, 70, 175 n
 Bosanquet, B , vii
 Bradley, F H , 69 n
 Brown, Thomas, vi n , 142 and n ,
 143, 144, 145

 Campbell, G , vi n
 Courtney, W L , vi and n., 187 n
 Crackenthorpe, 68.

 Hamilton, Sir W , 15, 21, 22, 23,
 24.
 Hartley, 9
 Hobbes, 31, 33, 34, 35, 36, 37, 38,
 39, 40, 41, 43, 55, 69
 Hume, 175 n , 191 n

 Jevons, W. S , vii, viii, 175 n.
 Johnson, W E , v, 77-84, 89, 126
 Joseph, H W. B , v, 28, 68, 74, 75,
 77 n , 78.

 Kant, viii, 1, 9.
 Keynes, J N., 27, 28, 77 n., 78,
 146 n.
 Knox, T. M., ix.

 Locke, 1, 9, 41, 46, 47, 56, 162.

 Mansel, H L , 21, 22, 24, 77 n.,
 78
 McCosh, J , v n., vi, 187 n.

 Price, H H , viii, ix
 Prichard, H A , viii.

 Reid, Thomas, 9.
 Russell, B , 7 and n

 Spencer, H , 187 and n , 188.
 Stebbing, L S , vi, 78 n., 85 n.
 Stewart, Dugald, vi n , 175 n , 178,
 179

 Venn, J , v, 77 n , 78, 101 n.

 Welsh, D , 142 n.
 Welton, J , v, 68 n , 77 n., 101 n.
 Whately, Archbishop, vi n., 15, 24,
 34 n , 78, 81 n , 105-6, 124, 138
 and n , 150, 154, 155, 156-9, 162,
 174.
 Whewell, W., 154, 179, 183, 185-7,
 191.
 Wilson, J. Cook, 26.
 Wittgenstein, L., vi-vii.

 Zabarella, 68.

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